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Railroad Men Easy Picking

MILLIONS OF DOLLARS are lost each year through the purchase of more or less worthless securities by workers who can least afford to lose their savings. The situation has become so serious that the bankers in some states have combined in carrying on publicity campaigns, suggesting that no investments should be made without consulting a banker. Not a few publications, including dailies and magazines, conduct special departments where inquiries are answered as to proposed investments. Railroad workers, judging by the amount of worthless securities which many of them hold, have proved a particularly fertile field for the operations of those whose principal business in life is selling speculative or worthless stocks.

Many railroad men have also invested their savings in companies to promote the development and sale of patented specialties for use on the railroads. In too many cases they have been carried away by the enthusiasm of the inventor or promoter and have failed to secure advice from experts as to the practicability of the device in question. Much disappointment and loss could be avoided if those who desire to invest in such propositions would first insist upon having the merits and possibilities of the device passed upon by a committee or group of responsible railroad experts. Too frequently the promoters of such devices will refer in broad terms to the fact that the device has been submitted to the Interstate Commerce Commission or some other commission, or they will call attention to the great possibilities of a particular device because some commission or other has issued an order or made a statement to the effect that certain improvements are desirable or should be made in the future. Such statements obviously mean nothing so far as the merits of the particular device are concerned, unless they can be supported with some evidence that the commission or body referred to actually made a painstaking investigation and recommended the device in question.

The efficiency of a worker may be so affected by the fact that he has made a bad investment which may involve the greater part or all of his savings, that it would seem that the railroads could well afford to make some arrangement to advise their employees, upon request, as to whether or not a given investment was a safe one. Undoubtedly, also, the brotherhoods, and particularly those that are conducting banks or have savings, beneficial or pension departments, would be glad to advise their members as to the safe investment of their funds.

Obviously, also, the Interstate Commerce Commission or other public bodies should use great care in the wording of such orders as they may issue, so that the speculators cannot find an opportunity of taking advantage of the public.

Shall Railway Rates Be Based on Prices?

THE PRINCIPAL ARGUMENT that has been advanced recently for reductions of the freight rates on certain farm products is that the rates on these products are excessive in proportion to the prices that the farmers are getting for them. The freight rates should be reduced, it is argued, because the prices of the products are low.

If it is sound to argue that rates on some commodities should be reduced because their prices are low, then it is equally sound to argue that the rates should be increased on any commodities the prices of which are high. This argument in favor of reductions in rates on farm products is constantly advanced in a way that gives the uninformed the impression that the prices of all farm products are low; and that, therefore, the rates on all farm products should be reduced. It happens however, not to be a fact that the prices of all farm products are low. The comparisons almost invariably made by those who use this argument are between prices in 1913 and at present. There are several farm products the prices of which at present are much higher, compared with railway rates, than they were in 1913.

The average railway rate per ton per mile in the entire country is now 54 per cent higher than in 1913. The average rate of the western lines is 39 per cent higher, and the average rate of the southern lines is 44 per cent higher. Since most farm products are produced in the western and southern states, it is only fair that the prices of farm products should be compared chiefly with the rates of the western and southern lines. The United States Department of Commerce publishes monthly a large pamphlet entitled "Survey of Current Business." In the January issue of this publication (page 5) there are given statistics showing the relationship between recent average prices of 13 farm products with the prices of the same products in 1913. These statistics show, among other things, that the price of lambs is 80 per cent higher than in 1913; of wool, 132 per cent higher; of cotton, 100 per cent higher, and of tobacco, 108 per cent higher.

Now, if freight rates on cereals should be reduced because the prices for them are relatively lower than the freight rates, it follows on the same principle, that the rates on lambs, wool, cotton and tobacco should be very largely increased. Will the farmers that produce these things voluntarily consent to an advance in the rates on them in order that reductions of rates may be made upon other farm products? It may be said that since cotton and tobacco are grown chiefly in the southern states, while cereals are grown chiefly in the western states, this would be penalizing the southern farmers for the benefit of the western farmers. Is there any good reason why the railways should be penalized for the benefit of the western farmers rather than that part of the farmers should be penalized to benefit other farmers?

As a matter of fact, however, it is not true that under this plan all the advances in rates would be made in southern territory, and all the reductions in western territory. Eighty per cent of all the sheep, and 85 per cent of all the wool of the country are produced in western territory. Furthermore; it is not true that all the cotton and tobacco are produced in the south—or, rather, in the southeast. There are only five states in which the production of tobacco is greater than in Wisconsin, and there are some other western states in which tobacco is grown. There are six states west of the Mississippi river in which substantial amounts of cotton are grown—Texas, Arkansas, Missouri, Oklahoma, California and Arizona. Texas, a western state, produces two and one-half times as much cotton as any other state. Arkansas ranks fourth among the cotton producing states, and Oklahoma eighth. Obviously, if the Interstate Commerce Commission is to re-

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duce the rates on hay and grain because the prices of these things are low, it will thereby lay the foundation for the railways immediately to bring a case for large advances in the rates on cotton and other farm products the prices of which are so high. Would Senator Arthur Capper, Dante Pierce of the Iowa Homestead, Clyde M. Reed, chairman of the Public Utilities Commission of Kansas, and others who are advocating reductions of rates on some farm products because the prices are low, support the railways in any effort they might make to secure advances in the rates on farm products the prices of which are high? We fancy if they should do so their present popularity among the farmers would rapidly diminish.

There are many other commodities the freight rates on which, on this theory, should be immediately advanced. Among the commodities which the "Survey of Current Business" of the Department of Commerce shows are now selling for much higher prices than in 1913, and the increases in prices shown are the following:

	Per cent higher than in 1913
Sugar	60
Cotton yarns	83
Cotton print cloth	123
Cotton sheeting	190
Worsted yarns	112
Women's dress goods	69
Suitings, wool	121
Silk, raw Japanese	117
Leather, chrome calf	67
Boots and shoes	104
Coal, bituminous, Pittsburg mine run	191
Coke, Connellsville	195
Pig iron, basic valley furnace	90
Lead, pig, desilverized	65
Lumber, southern pine	114
Lumber, Douglas fir	112
Brick, common red, domestic building	125
Brick, common bldg., salmon	76
Cement, Portland	73

It will be noted that the price of each of these commodities shows a relatively greater increase since 1913 than the average freight rate of the railways as a whole. Therefore, on the theory that freight rates should be based on prices, the average freight rate of the railways on these commodities is too low, and ought to be advanced.

A glance back into the history of prices shows that on this same theory the freight rates on practically all commodities should have been increased several times as much in past years as they were. The last advance in freight rates was made in 1920. In that year northern spring wheat showed an increase in price over 1913 of 254 per cent; corn, 231 per cent; oats, 196 per cent; cotton, 231 per cent; wool, 250 per cent; lambs, 163 per cent. All these are farm products. In this same year (1920) flour showed an increase in price since 1913 of 228 per cent; sugar (New York), 498 per cent; cotton print cloth, 378 per cent; wool suitings, 191 per cent; boots and shoes, 208 per cent; coke (Connellsville), 537 per cent; pig iron, 230 per cent; southern pine lumber, 355 per cent; Douglas fir lumber, 307 per cent; domestic building brick, 281 per cent. Why should railway rates at the peak in 1920 have shown a paltry increase of only 78 per cent when such prices prevailed?

Throughout the entire seven years from 1913 to 1920 railway rates always were relatively much lower than prices. Up to September, 1920, the increase in freight rates had been only 36 per cent, while the average increase in the wholesale prices of all commodities was 126 per cent. For a comparatively short time after the great decline in prices occurred, the average railway rate was relatively higher than the average wholesale price of commodities. As a result of recent reductions of railway rates and increases of prices, this general situation has again been reversed.

The theory that railway rates should be based upon prices has not been applied in the past. If it is a sound theory at any time, then it is a sound theory at all times. If it is to be applied now in making the rates on some commodities, it should obviously be applied in making rates on all com-

modities. If it should be seriously proposed by shippers and regulating commissions that it should be applied not only now and to a few commodities, but consistently and to all commodities in future, the railways should and will enthusiastically accept it.

They would have made a great deal more money in the past if it had been applied, and they will make a great deal more money in future if it is applied than if, as in the past, freight rates are to be regulated mainly on the basis of the cost of railway service. Of course, the real difficulty about applying the theory is that those producers and shippers whose prices are low will always accept it gladly, while producers and shippers whose prices are high will insist, as they have in the past, that the railways have no right, by advancing rates, to share in the prosperity of those who are prospering because they are getting high prices.

It is doubtful if the Interstate Commerce Commission will grant reductions in the rates on a limited number of farm products because the prices of those products happen at this time to be relatively low. If it does, however, the railways might well promptly accept the principle of basing rates on prices and immediately institute proceedings for large advances in rates on all commodities, including farm products, that are now selling for high prices. The railways themselves would, in the long run, be the greatest beneficiaries from definite establishment of the principle that freight rates should be made low on commodities the prices of which are low and high on those the prices of which are high, and that they should be reduced when prices decline and advanced when prices increase.

"Pegs" Expedite Train Movement

THE "PEG" SYSTEM of freight train operation has been in successful operation on the Buffalo, Rochester & Pittsburgh since 1916. With its introduction, the time per freight train over an engine district was reduced on an average varying from one to two hours. A "peg" is a schedule—not a time table schedule which cannot be varied from without a train order—but a schedule just the same, and one which train crews, yard forces, enginehouse foremen, dispatchers—everyone who has anything to do with train movement—must respect and work to maintain.

The system of pegs was not installed on the B. R. & P. until tests had been made to determine the time necessary for reasonably expeditious performance of the many things that trains are required to do in moving between two terminals; viz., actual movement from station to station, taking water and coal, clearing the lines for superior trains, picking up and dropping helper engines and the like. The peg differs from the ordinary freight train schedule in the time table in that it is meant to be observed closely, except that it may be exceeded without annulling it; the time table schedule, on the other hand, is rarely followed closely, especially by the following sections; it exists more for the purpose of reducing the number of train orders than as an actual timing arrangement to which trains can be expected to adhere.

Some of the advantages claimed for the peg system—we think justly—are:

1. It gives train crews and others definite information as to what is expected of them.
2. It enables enginehouse foremen to systematize their work, since they know always at just what times they will be called upon for power.
3. It does not permit yardmasters to run trains in bunches whenever power, tonnage and crews are available. Trains so bunched have to assume space intervals out on the line, bringing greater payments in overtime and keeping engines on the road when they could as well be in the roundhouses.
4. It systematizes dispatching. Meeting and passing

points soon work themselves out on an orderly basis and dispatchers can give greater attention to irregularities of movement rather than diverting their attention to the entire body of freight train movement in their districts.

The B. R. & P. has both single and double track and the system has been equally successful on both. A sufficient number of pegs are provided to take care of maximum business and no train is run in the ordinary course except on one of these pegs. If for any reason a train cannot be run on one of the pegs because of lack of power or tonnage or crews not available, that peg is simply abandoned. No train orders are necessary for this.

This system has met with such marked success on the B. R. & P. that we feel that many other roads could profitably examine its merits. It is not thought that the system would bring greatly improved results on lines of great density necessitating three or four tracks but, on the other hand, it should be applicable to almost any single or double track line. Considering the large percentage of American railways which come into this latter category, therefore, we feel that we can without hesitation recommend to the attention of most of our readers the article describing this system which appears on another page of this issue.

Why Not Call in the Consulting Engineer?

THE LAST DECADE has seen a marked increase in the application of scientific methods to railway transportation—the result of a greater appreciation of the man with knowledge and experience in highly technical work. In fact, it is only through the employment of men possessed of adequate training along these special lines that the roads have attained a high degree of success in the broader application of water treatment, timber preservation, reinforced concrete construction, etc., to railway uses, and in the preparation of more effective designs for shops, locomotive terminals, large freight houses and other important facilities. But in general, it is only the larger roads which have profited to the fullest measure from this advance in applied engineering. The obvious restrictions which the smaller roads must place on the size of the chief engineer's or the general manager's staffs has necessarily curtailed the employment of men skilled in certain lines. Another obstacle arises from the fact that for certain classes of work, such as the planning of large improvements, the smaller roads have only occasional needs for the designer and he cannot be constantly engaged in work calling for the full exercise of his ability.

For this reason, the lesser properties are handicapped when confronted with the specialized or occasional problem and have, therefore, looked for assistance outside of their own organization when such problems have arisen. There are a number of reasons, however, why the consultant has not frequently been brought into service on the railroads, chief among which is the attitude of the railway engineering officer. The chief engineer hesitates to recommend such assistance on a problem like water treatment, for example, because he feels that it implies an admission on his part that he does not know all that he ought to know about everything for which the management could call on him. Another reason is the attitude of the management. Railway organizations, as a whole, are built up of men whose chief qualification is dynamic energy; they are men who get results. Therefore, the president or general manager who is confronted with some special problem is likely to assign it to a particular man, not because he is possessed of any special knowledge in that field, but because he has demonstrated keen intellect, energy, integrity and a well developed sense of responsibility. The

idea that an outsider could be called in who would be able to apply knowledge not possessed by any one in the organization does not often gain ground in railway councils.

There is, however, a real need for the application of special knowledge to many railway problems in which specialists would be invaluable. Owing to the fact that railways have availed themselves so infrequently of such consulting service, there are in fact very few specialists in purely railway problems. On the other hand, there are many men in railway service today whose services to railway transportation in general could be increased immeasurably if they were insured enough calls for their services to warrant their entering the field of special consulting practice. This is not a problem of moment for the large railroads; but for the smaller ones, it is. They would have much to gain from the services of a consultant who would be at call when his special knowledge was required.

The Necessity for a Larger Tie

IN THE EARLY DAYS of American railway development the strength of even the lightest track construction was far beyond that required to carry the locomotives and cars of that period. The light rail and the small tie carried the loads of those days without signs of distress. That condition was of short duration. It was early recognized that the development of American railways lay in the operation of heavier trains. These were made possible by larger locomotives and as this heavier equipment was placed in service, it became necessary to increase the strength of the track. This development has continued up to the present day when the 100-lb. rail has demonstrated that it cannot stand up under the traffic on many roads and it is giving way to heavier rail.

There has also been an increase in the support given the rail. The number of ties has increased from 14 or 16 to 18, 20 and 22 in a 33-ft. panel. Little further development can be expected from this quarter as the ties are now spaced as closely as is possible and at the same time permit tamping between. Further support must be given by the use of larger ties, even to the extent of decreasing the number, where this is necessary, to allow the proper tamping space between.

There has been some progress in this direction in recent years. The 6 in. by 8 in. tie has given way over a large territory to one 9 in. wide on top and in some instances 10 in. At the same time the thickness has been very generally increased to 7 in. Where ties 5½ in. thick and 6 in. wide on top were formerly accepted as 6-in. by 8-in. ties, many roads now insist on a 6-in. thickness for all ties and 8 in. width on top for the major portion of them. Excellent as this tendency is it has not yet gone far enough or been adopted generally enough to meet the conditions imposed by the traffic. The fact that an over-loaded rail shows signs of distress calls attention to it at once, while the similar over-loading of a tie may remain unobserved as it is buried in the ballast.

The primary purpose of a tie is, of course, to transmit to the ballast the load delivered to it by the rail. The bearing area of a tie is therefore a primary consideration. But there are other considerations; the strength of the tie is a factor. Furthermore, the larger tie, particularly when treated, has a greater proportionate resistance against decay and mechanical wear than the smaller tie and can stand greater inroads before requiring renewal. Also a strong tie will provide a better support for the rail and thereby retard its deterioration. It will also reduce the labor of track maintenance, as any track foreman will bear testimony by the rapidity with which he will select the large tie for his section, if given a chance, even though it is heavier to handle.

As the size of the tie is one consideration in the design of the track structure, its determination is an engineering prob-

lem and as such should be arrived at by careful study by the engineering department. After the requisite size has been determined this department should give sufficient attention to insure that ties of the size desired and specified are actually being secured. This is pertinent at the present time when the practices which prevailed in many quarters prior to federal control are again appearing. No matter what size a tie may be, so long as it is not too large or too small for use, it complies with one of the standard sizes. There is consequently no difficulty about getting any of the standard sizes which the engineering department may choose. Of course the wider the range of the standard sizes used the easier is their procurement. But there is no reason why those responsible for maintenance of track should not be provided with ties separated into standard sizes for use where required. If smaller sizes must be provided because larger ones are not available or are considered too costly, they should be substituted openly as such and not accepted, paid for, shipped, and used as if of a larger standard size. This tendency is to be deplored under any conditions and particularly so when it will undermine the strength of the track at a time when the reverse is required.

Locomotive Operating Costs

THE PROBLEM of the effect of the characteristics of the locomotive on railroad costs is one of the most important matters with which railroad officers have to deal because the motive power affects such a large proportion of the expenses. In this respect it is similar to the question of changes in grade and alinement. The effect of grades and curves has been reduced to general formulas which, although they are not exact, are of great value in determining what savings can be expected from changes in operating conditions. Anyone who could develop a similar method to show the effect of changes in the design of motive power on the cost of fuel, wages, etc., would do the railroads great service.

The fact that changes in costs cannot be determined by any general method does not, however, prevent a compilation of data covering individual cases. If enough figures could be collected it should not be difficult to establish some rules to show the general effect of a single factor, such as tractive force, on operating costs. Anyone who attempts to obtain comparative statistics regarding the cost of operation of various types and classes of locomotives under different conditions of service cannot fail to be impressed with the meager amount of data bearing on this subject that is available at present on the majority of railroads. This should be a promising field for investigation by the Mechanical Division of the American Railway Association. At the start it would be desirable to simplify the work by confining it to the major items—fuel, wages of enginemen and trainmen, running and classified repairs, enginehouse expenses, and interest and depreciation. These items alone would give a good indication of the relative economy of locomotives. If greater refinement were required such items as maintenance of way and cost of water, lubricants and other supplies might be included. The effect of the type of motive power on track capacity is a special problem but it is an important one.

The great need at present is for some reliable data that will enable the operating or mechanical officer to decide definitely whether a Consolidation, Mikado, Santa Fe or Mallet type is the most economical for his railroad. In most cases the only guide is the judgment of the men who make the decision and while their experience will usually keep them from going far wrong, in matters involving the expenditure of millions both in capital and operating expenses a railroad should not be satisfied unless it has definite figures on which to base decisions.

New Books

Petroleum Register; 430 pages, 9 in. by 12 in., bound in cloth. Published by Oil Trade Journal, New York.

Beginning with the January, 1923, issue, the Petroleum Register will become a semi-annual, instead of an annual publication. For a number of years this has been recognized as the standard directory and reference work of the companies and individuals engaged in producing, refining and marketing petroleum and its products. Lists are also included of manufacturers of and dealers in equipment used by the industry. An excellent index, together with considerable statistical material, adds to the reference value of this book.

Asiatic Markets for Industrial Machinery, by Walter H. Rastall. 333 pages. 6 in. by 9 in. Paper covers. Published by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

This report Mr. Rastall wrote after an extended visit at every port in the Orient between Yokohama and Bombay and it represents the best survey to be obtained of the markets for all kinds of American machinery in that part of the world. The work is well illustrated with photographs and charts. The peculiar conditions of each market, the nature of competition which has to be faced and suggested methods for developing trade in various machinery lines are discussed in detail. Any manufacturer of machinery who is interested in the possibilities of an Oriental market for his products will find it of interest and value.

Belt Conveyors and Belt Elevators. By Frederic V. Hetzel. Bound in cloth, 333 pages, 291 illustrations, 58 tables, 6 in. by 9 in. Published by John Wiley & Sons, Inc., New York.

This volume, contrary to the idea which its title might infer, does not treat the subject of material handling from the standpoint of where such equipment could be, or has been, used. On the other hand, it discusses the fundamental principles of the design and construction of belt conveyors and belt elevators or, as the author states in his preface, the details of the "how" and "why" of conveying and elevating by belts. It is essentially a book for the engineer who is concerned with this problem although it forms a practical reference for anyone who comes in contact with conveying machinery.

There are numerous chapters of interest to the railway man devoted to the design, construction and operation of equipment for use with bulk materials, such as coal, coke, ashes, ore, grain, sand, stone, etc., accompanied by references to and short descriptions of actual railway installations.

Proceedings of the American Society for Testing Materials. Two volumes; Part I, 1023 pages; Part II, 591 pages; illustrated, 6 in. by 9 in. Bound in cloth. Published by the society, 1315 Spruce street, Philadelphia, Pa.

The proceedings of the twenty-fifth annual meeting of the American Society for Testing Materials, held at Atlantic City, N. J., on June 27-30, 1922, have been included in two volumes the subject matter of which has been logically divided between the two parts. Part I contains the reports of 34 of the standing committees of the society together with the discussion of these reports which occurred during the annual meeting. It also contains 84 tentative standards which have either been revised or are published for the first time. The second volume, Part II, contains 36 technical papers, together with the discussion on them, the annual address of the president of the society and the annual report of the executive committee. Among the subjects which appear in Part II, are a symposium on impact testing of materials, and results of numerous and varied studies and tests on metals, wood, concrete and paints.

Letters to the Editor

[The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Mixture of Creosote and Crude Oil for Ties

KANSAS CITY, MO.

TO THE EDITOR:

I have read with a great deal of interest an article by C. M. Taylor in the *Railway Age* of March 3 on the shortage of creosote oil threatening the wood preserving industry, and I thoroughly agree with Mr. Taylor's statement of facts (assuming he meant them to apply to ties only). No one in the industry has a broader and more extensive experience in this field of engineering than Mr. Taylor, and I am sure the purchasing public will read his article with a very sympathetic ear and take steps to benefit by his advice to the good of the industry. There are one or two phases of this subject, however, as outlined by Mr. Taylor, that I feel should be given very careful consideration by the users of treated timber, before they adopt Mr. Taylor's recommendations in their entirety.

I refer first to his statement as to the probability of one-fifth of a pound of creosote oil per cubic foot of timber being sufficiently toxic to prevent decay in timber (and he has quoted a very high authority to this effect). Of course, Mr. Taylor intends this to be taken in a scientific sense, but I am afraid users of timber may give it too broad a meaning if not qualified very strongly. He also recommends the use of crude oil and creosote with a final retention of six pounds of the mixture per cubic foot of timber.

If Mr. Taylor was treating these ties himself, I do not question that he would have excellent results with a mixture consisting of three pounds of creosote and three pounds of crude oil, but I do not think the public generally can undertake any such experiment on a large scale and be assured of the proper return on their investment, unless there are very radical changes in the administration of the usual treating operations.

Speaking first of three pounds of creosote being sufficient to prevent decay for the mechanical life of ties, I would like to recite a little history that may be enlightening: When the first large experiment with the Rueping treatment was undertaken at a railroad plant, there was retained in the timber after first being thoroughly air seasoned, a varying amount of creosote ranging by the run from $2\frac{1}{2}$ lb. to 9 lb. per cubic foot of timber. These ties were treated under the supervision of a number of experts, and very careful records were made and kept. After the ties were taken out of the cylinder, they were weighed, piled and held for 30 days, carefully marked and then weighed again, and sent out in carload lots to different divisions on the Santa Fe system, and a continuous record has been kept upon them during their entire life in track. The ties that received approximately $2\frac{1}{2}$ lb. of creosote per cubic foot lasted, if my memory serves me correctly, approximately 9 years, while the ties that received 9 lb. per cubic foot are in track today in as good condition chemically as they were the day they were put in the track.

There is no question but that approximately 5 lb. of creosote injected by a process that will thoroughly impregnate

every spot of sap wood, will be more than ample to preserve the tie from decay longer than its mechanical life, as easily demonstrated by the 40,000,000 or more such ties on the Santa Fe system and large numbers on other prominent railways, but I do not hesitate to say after watching these ties for 19 years that these ties treated with 5 lb. of oil per cubic foot would have rendered more life if they had contained a couple pounds more oil per cubic foot. I am sure that Mr. Taylor or any other timber preserving engineer will agree in this conclusion. From the above experience, I do not feel that the railroad purchaser is going to be entirely safe in purchasing treatment or having ties treated at a railroad plant with as small an amount of creosote per cubic foot as suggested by Mr. Taylor.

Now as to the mixture treatment, I have treated several million ties with a mixture of crude oil and creosote over a period of some 15 years, and I have been in a position where I could observe the results of these ties in track. I do not hesitate to say that the result of these long years of experience with the mixture of crude oil and creosote in ties have convinced me of the absolute merits of this practice. But I am afraid that the general adoption of such a treatment as is suggested by Mr. Taylor, at the average railroad or commercial plant, without a much better understanding of the principles involved, will result in disaster to some of those roads that can afford it the least, and I would hate to see it become a generally recognized practice without a better understanding of the problems involved: First, no treatment of this kind should ever be undertaken by any plant without the constant presence of an experienced chemist to supervise the treatment throughout, and I want to say that I do not know of such a chemist in the industry today that is willing to give an absolute test that will tell one how he can definitely determine the percentage of such a mixture after it is made, notwithstanding the fact that I have discussed this question at length with the experienced chemists that have practiced it for years. This does not mean that it cannot be done, but it means that we lack experience yet that can be an absolute guide. But either a railroad or a commercial plant that will practice this treatment without an experienced chemist in charge, and leave the details to the average plant operator who is not a trained chemist, would be criminally negligent, and bring disgrace and great financial loss to the industry and the purchaser of such material.

I am ready to admit that Mr. Taylor or any other timber treating engineer could treat ties with a 50-50 mixture of crude oil and creosote leaving in 6 lb. per cubic foot with a guarantee of absolute results. I believe that I am safe in saying that 95 per cent or more of all the ties treated by the mixture treatment that have given a long life, have had at least 4 lb. of a high-grade creosote per cubic foot of timber in addition to the crude oil. I hate to see the impression left that a 50-50 mixture of creosote and crude oil with a final retention of 6 lb. per cubic foot is based on satisfactory records of past performances. Let us be satisfied with the treatment that we know has given satisfactory results for a long period of years, and then take steps to see that it is only carried on under the supervision of trained men who know absolutely what they are doing.

By using an 8 lb. final retention of a 50-50 mixture, we will be reducing the cost of our present creosote treatment greatly and will have behind us a record life of actual performances that will justify the confidence which we should have in work that calls for such a large financial outlay. And above all things do not let us assume that because we buy a carload of crude oil and a carload of creosote and send them to a treating plant for the treatment of ties by mixture process, we are going to have all ties treated with a mixture that accurately approaches a 50-50 mixture, unless it is under the supervision of an expert who knows how.

During all the years that I operated a railroad treating

plant or was responsible for its timber preservation, I never allowed these plants to be run without two distinct checks upon the operation; first, an experienced superintendent who was responsible for the entire operation, and second, a chemist who acted the same as an inspector at a commercial plant, who was able to look after the work and see that it was done in the best possible manner, and was held responsible for the integrity of the treatment, entirely independent of the superintendent of plant. I hope those of our friends who follow Mr. Taylor's advice will take the proper safeguards to see that they are getting the results that they expect.

The only difference of opinion between Mr. Taylor and myself is regarding the factor of safety with the average plant operation. No good engineer designs a structure without a good factor of safety and I plead with the users of treated material to consider this and adopt safety methods that we know will give results.

GEORGE E. REX,

Vice-President, National Lumber & Creosoting Company, and formerly Superintendent of Timber Preservation, Atchison, Topeka & Santa Fe.

Neatness and Morale

WASHINGTON, D. C.

TO THE EDITOR:

I have just read your editorial on page 546 of the *Railway Age* for March 10 entitled "A Little Gold Stripe." Allow me to second your motion for more attention to the appearance on our passenger locomotives.

While it would obviously be impossible to present statistics to show that clean and well-painted locomotives and rolling stock increase passenger business, I have an idea that this is much more of a factor than is ordinarily supposed. About the only way in which the average traveler can judge the condition of a road's locomotives is by their appearance, and a handsome engine gives the impression that the inner workings of the machine are in first-class condition, and that the road will, therefore, be likely to carry the traveler safely and punctually to the end of his journey. Of course, the engineer knows that worn-out pieces of machinery, which ought to be sent to the scrap heap, can be painted up so as to cover a multitude of sins, but no railroad is apt to go to such lengths as this.

As to the effect on engineers and firemen, I think that the case might be put even in stronger words that you have used in your editorial. Some railroads have already recognized the psychological effect of providing their men with good looking engines. One road, with which I was connected for a short time, went so far as to allow the enginemen themselves to apply a certain amount of decoration to the locomotives, the material being charged to them, as I remember it, on a cost basis. The reason for doing this was simply that the men liked to run a machine having a little different appearance from the others on the road, and as no piece of machinery with any kind of decoration on it looks well unless it is kept clean, the men naturally attempted to keep their own engines in first-class condition.

The effect of handsome machinery on the men operating it has long been recognized in connection with stationary power plants, marine engines, and the fire departments of our different cities. All these furnish examples of the use of a certain amount of paint and bright work simply for the sake of appearance and because the operators will take a greater pride in such equipment.

Standardization in the things that really count is all right and cannot be too much encouraged, but we all know that even the owner of a "flivver" likes, if possible, to have some distinctive scheme of decoration which will make his car look a little different from that of his neighbors.

HUGH G. BOUTELL,

Associate Engineer, Bureau of Standards.

Divided Responsibility Encourages Laxity

SAN FRANCISCO, California.

TO THE EDITOR:

Why does the entire crew (two to seven men) overlook the same train at the same time and place when there is a main line meet? There is but one logical reason—each depends entirely too much upon the other to take care of a situation; and sooner or later no one takes care of it. We may say it is the numerous little things of not enough importance to make a fuss about, that roll up like a ball of snow until an accident occurs. Again, how about the oversight on the part of the employee who has a perfectly clear record, but who, finally, on his first violation, causes a most disastrous collision? Would he have "forgot" had he thoroughly impressed upon his own mind that he alone was responsible? Perhaps so, but would not the percentage of such "accidents" be reduced if the responsibility were not divided? I believe it would, and therefore I cannot agree entirely with Mr. Forman in his able article in the *Railway Age* of February 10, entitled, "Little Drops of Water, Little Grains of Sand."

The examiner referred to in Mr. Forman's article, who reminded the conductor that there was an air signal for notifying the engineman to call in the flagman, could not always live up to his own instructions, for the reason that there is no communicating signal on freight trains. Where there is one authorized signal there are a dozen unauthorized ones used in operating a train. Might it not have been better to permit the use of the hand signal in question and give the conductor a little more time to read the orders he had just received? Fretting over the possibility of being reprimanded on some trivial thing by some over-zealous officer no doubt contributes to the cause of some serious accidents.

We have a rule in the Standard Code that requires one employee to report another. Do you really think that they will do so if there is any chance to cover up the dereliction? Who are the officials? The same employees who in former years refused to report each other. How many railroad officers in the United States can say that they never reprimanded or disciplined a man for doing the very thing they themselves had done?

I cannot agree with Mr. Forman's remarks regarding the duties of the train dispatcher. Conductors and enginemen have agreed to certain working conditions and rates of pay and it is their duty to render adequate service. Why should the train dispatcher be censured after a collision occurs for not having said to an operator: "They meet extra — there. If the extra is not in the clear let them stop for the order, as they must stop anyway."

Did the train dispatcher not make the meet properly? Is there any one that we may hold for not reminding the train dispatcher had he made the wrong meet or issued the wrong order? Is he infallible? Is he superhuman? No! He is just a train dispatcher, made out of the same kind of material as the conductor and the engineman, who are required to understand the rules by passing the regular examinations. Then why should the train dispatcher carry their burden? Hasn't he enough to do to handle his proper work without being appointed a guardian for operators and train and engine men to keep them from going wrong? I know a train dispatcher who once lost his position because he did not move the trains promptly. He had a habit of sending an explanatory message to conductors and enginemen nearly every time he issued an order.

When train dispatchers continually caution operators and train and enginemen not to do this or that, does it not have a great tendency to weaken the eternal vigilance that should be required of them? Several years ago a section of double track was being used temporarily as single track, in making

a rail change, and the order was in effect for several days. Then it was annulled and a like order issued singling the opposite track for the same purpose. The whole crew of a passenger train left their initial station and ran off a short rail because they did not properly read their order, or did not read it all; they assumed it was the same old order. The dispatcher was taken out of the service, I understand, for not calling the conductor's and engineman's attention to the change in the order—a plain simple statement and issued strictly according to the Standard Code form. Can any just man rightfully say that the train dispatcher was at fault?

I can remember when train dispatchers were required to tell extra trains to "Look out for extras ahead and following"; "Don't leave until Extra — arrives"; "You can't get out for No. — (a superior train)"; "Bridge No. — washed out" or "Embankment gone, don't pass over it until repaired." That was in the feeble-minded stage of railroad-ing. Give the train dispatcher an even break. Give him a chance to perform his own duties and require of others the same. Hold each responsible for his own acts. Divided responsibility and jawbone instructions, beyond a doubt, have been the cause of loss of many a life and of much damage to property.

WM. NICHOLS.

New England and Its Weak Railroads

NEW YORK CITY

TO THE EDITOR:

The article which appeared in your issue of February 24 on the Boston & Maine is of a character that interests many of your readers. In reading such information they become somewhat familiar with a road's individuality. We have had so much talk about railroad generalities that the individual problems have been lost sight of. In that article you say that the B. & M. is a terminal road with large proportion of short haul traffic and l.c.l. freight. Is the writer of that article quite sure of these statements? The average haul per ton on the B. & M. is 133 miles, as compared with: D. & H. 137; Reading 101; Jersey Central 72; B. R. & P. 151; New Haven 110. The l.c.l. tonnage was a few years ago from 18 to 20 per cent—almost the same as the New Haven; but it has dropped nearly 50 per cent to 10 per cent or thereabouts of the total, as has the New Haven. The loss of l.c.l. traffic due to motor trucks has lengthened the average haul.

Not long ago the writer, in addressing one of the commercial bodies in New Hampshire, pointed out three factors affecting the B. & M. which are not generally considered. The first is that its financial structure still reflects the excessive prices paid for some of its constituent lines, though in a number of cases this burden has been transferred from a fixed obligation to a dividend "if earned" on the present preferred shares. Particularly and to illustrate I mentioned the acquisition of the Connecticut River in 1893. This was done when Mr. McLeod, of Reading fame, was for a short time head of the B. & M., while the New Haven, under C. P. Clark, was rapidly expanding. The Connecticut River was paying, and barely earning, eight per cent. The B. & M. leased it for ten per cent and allowed a 50 per cent scrip dividend carrying five per cent interest; so that a holder of Connecticut River shares formerly getting eight per cent received $12\frac{1}{2}$ per cent. A number of other instances could be cited as equally beyond real values.

Again I pointed out that in no section of the country had railway lines become so obsolescent as is the case with many of the New England short branches. It is just the case of the canals over again. The railroad in this locality is no longer the sole means of land transport. The B. & M. and the New Haven are both consolidations of systems formerly

intense rivals—in the case of the B. & M. it was rivalry of four lines—the Eastern, the original B. & M., the Boston & Lowell, and the Fitchburg. In the New Haven territory it was the New Haven and the New England. There never was business enough for all the lines; and now, since operating costs are high, the situation is worse. If anyone will take the B. & M. folder and examine it, he will find, out of over 2,000 miles operated, that over 400 miles of this has but two passenger trains a day each way, for six days a week, with possibly one on Sundays.

As a matter of fact on practically all of this mileage the only freight is a local, each way, six days a week. Assume the passenger trains earn \$4 a mile (which they do not, on these lines) and the freight the same, we have 6×4 or \$24 a day—less Sundays; but say $30 \times 24 = \$720$ per mile per month or less than \$9,000 per mile per year. The average system mileage earnings are about \$38,000. If 20 per cent of the mileage only earns \$9,000 or less per year per mile, we see what a load, financially, these obsolete lines are. If one wants to work out the New Haven figures they will be found almost identical. Can the important lines of the road carry this burden? Certainly not. No I. C. C. appraisal is going to save them; they are useless, just as the canals were 60 years ago, when practically all of the 8,000 miles of canals throughout the country were abandoned.

But what is to be done? First, at the bottom, there is a considerable mileage so closely parallel to other lines that no community will suffer by abandonment. Other lines, really necessary to certain towns, must be kept up. The towns or counties must help to sustain them, to whatever degree may be agreed upon. For some two years Kansas has had a law providing for such support. Thirdly, the lines which do not pay for operation, but do so indirectly, can be maintained.

Since the writer spoke on these questions, and quite unknown to him, the B. & M. has applied to the New Hampshire legislature to abandon two branches, aggregating about 35 miles. On one of these branches the average passenger train earnings were about 70 cents a mile. On one branch of 15 miles the only two stations took in, together, a little over \$2,000 a year. This branch was built as a result of an effort of the Fitchburg to reach Manchester, but by some influence the legislation authorizing its construction specified that it should be by the Boston & Maine.

The sooner such conditions are recognized, throughout the country, wherever they exist, the better. There are a number of instances. On another branch the writer knows of one local freight and one through freight a day are running where 20 years ago there were 12 to 15 freight trains daily. That business exists today, but it moves on a parallel line with more favorable grades. There are but two or three small villages on this obsolete line. Motor cars might answer, possibly, if assisted by the communities; but certainly under the changed conditions the system cannot carry this burden.

Again, it is rather curious that, in the discussion of the New England lines and proposed consolidations, no one has called attention to the help the New London Northern line of the Central Vermont would be to the B. & M. The Connecticut River line feeds directly into it on the Massachusetts-Vermont-New Hampshire corner and again at Amherst from Northampton. It is cheaper and quicker to forward freight from New London to New York harbor by water than over the congested rail line of the New Haven road from New Haven. Again, it is only 60 miles from Norwich to Worcester; and if the B. & M. had freight-train rights over this line, it could reach all northeastern Massachusetts and southern New Hampshire from New York entirely independently, the line from New London to Norwich being assumed to be at its disposal as part of the New London Northern. If the public can only have some of these individual problems presented to it, as to each system, it will support the right solution of them. GEO. B. LEIGHTON.

Real Teamwork—Every Employee a Booster*

The Railroads, With Similar Handicaps, Can Surely Do What the Telephone Companies Have Done

By E. K. Hall

Vice-President of Personnel and Public Relations, American Telephone & Telegraph Company

THE KEY to this big industrial problem of mutual relations in industry, the problem of the relations of labor and capital—if you want to put it that way, though I do not want to—comes absolutely down to just one thing, and that is *state of mind*. In other words, it is the attitude of the owner, the manager and the employee, individually and collectively, toward the job.

Good wages, a steady job and good working conditions do not of themselves bring loyalty and interest to the job. In other words, they do not develop the desired attitude toward the job. What was the attitude of most of the workers in almost every line of business three years ago? The attitude of the average man working for wages was that he wanted more. It did not make any difference how good those wages were, he wanted more; and his principal interest was in getting more. Generally speaking, the workers in all industries had very little interest in the work that they were doing. Their interests ran to finding out how much they could get if called upon in emergencies to work overtime. They were interested in getting as high a basic wage as they could and then all the overtime that could be loaded on. Generally speaking, they had no sympathy whatever for the difficulties of management.

The Question of Wages

Now, if that is a fair statement of the average wage earner's attitude, an analysis of it ought to reveal why it was so. Unless we can find why they had that attitude toward the job we cannot hope to apply the remedy. Take first the question of wages.

Why was the majority of employees interested principally in more wages? Most workers, and I will say all workers to some degree, believed that the interest of the boss in the enterprise was first, last, and all the time to make more profits. Now, if that is what the boss is interested in—profits for the owners, whoever they may be—then why blame the worker if his only interest is how much money he is going to get out of it? If this is only a money proposition, if what you are after in the enterprise is money, and if the boss is going to get all he can regardless, why should not the worker chip in and get all he can, and why should he have any different attitude toward the job until he learns something different about the boss?

How About the Bosses?

I said the average worker had very little sympathy for the problems of the management. They knew little and cared less about the difficulties the management was having in trying to keep the ship afloat and the enterprise going. Why should the worker have any particular sympathy for the management, if the manager never demonstrated any sympathy or interest in behalf of the worker's problems? And he has got them. Every wage earner anywhere has his own problems—some that are mighty serious and which look just as big and just as important to him and much more real than the management's problems way up somewhere in an office that he does not know anything about.

Let us follow that a little bit further. The worker does not feel any particular friendship for the executives of the concern—the men who are carrying the big responsibility of the enterprise. Why should he have any respect for them or friendship for them? If they have not shown any for him, how is he going to show any or feel any for the management? How does the average workingman look at the chief executives of the company? I am going to say that certainly in businesses like yours and mine, where the men are widely scattered, the average worker never sees the chief executive and never sees a good many of the general executives. He judges the chief executives by the sample he has seen, and his sample is his immediate superior. If his boss is the human, red-blooded type of fellow who takes an interest in his men, he assumes the big bosses probably are all right. I am thinking of the boss or superintendent, whoever he is, whose men will say, "That fellow is all right, I'll go through hell for him." If all the bosses were like that there never would be trouble. There are a good many, but there are too many more of the other kind, who, as soon as they are made bosses—even a straw boss—begin to blow up like a pouter pigeon, and think they are the whole works. He thinks, "Well, here I am, a devil of a fellow," and for fear that everybody won't recognize it, he begins to drive and worry the men.

Wherever you have that kind of a straw boss or superintendent, he is the management to the worker and the worker thinks they are all that way. And when he thinks they are all that way he does not have a lot of respect for them and he is not going to break his back to help them carry their load.

Fantastic Ideas About the Owners

Why doesn't he think about the owners of the property? Why doesn't he remember that the owners have got big money invested in the project, that must make a profit or break down and go to the wall? He does not realize that anything he can do, or ought to do, to help the owners will benefit the owners or himself. What does he know about the owners? He sees only big figures in the paper or they are quoted to him by somebody—the figures on the balance sheet totaling millions of dollars in assets or hundreds of thousands of dollars of net profits or undivided profits, and he says to himself, "Why these fellows don't have need of any of my help."

He thinks of the owners as having barrels of money after paying all of their bills and all their stockholders; they have these undivided profits they don't know what to do with, and yet they kick because he wants 25 cents or 50 cents more for a day's work. I was talking not long ago with a man who had been a workman. He said that it was years before it ever occurred to him that the bosses, the owners of the companies, owed any borrowed money. Why should they owe any borrowed money? Why not draw a check and pay it—they had barrels of it, literally barrels of it, millions invested in the business. And they think that these big profits they see are being made—how? At their expense. Aside from all this, why don't they recognize the fact that if their wages are just, full, fair, free wages—why doesn't

*Abstract of an address before the New York Railroad Club, February 16, 1923. Space limitations prevent using a number of typical illustrations of the principles here set forth.

that settle it, and why doesn't that impel them to say, "Well, I am being paid good wages"?

How is a worker going to know whether his wages are just or not? How can he tell if he is not consulted about it? If he is not shown that the relation between his wages and production is a fair relation, how is he going to know whether his wages are just or not? And the same applies to working conditions. How can he know that the working conditions are good unless he has a picture of the necessities of the job and conditions in the entire industry and other industries whatever they may be?

False Ideas About Promotion

Many workers believe that promotions are based on favoritism and it is inevitable in the absence of an interest in the job that they should think so. It is so in almost every industry I have been able to get at. Most men think that some way or other they don't get a fair chance to advance. It does not occur to the average man that the reason he does not advance is because he is not good enough. Most of them feel that they probably are good enough sometime or other for their turn to come and move up, and unless they have a chance to talk that over with somebody they are pretty likely to think that somebody is holding them down. And the fellow who does advance they think is going up by "pull." It may be the pull of the straw boss who has taken a fancy to that particular individual, it may be the pull of somebody up ahead, or somebody outside the organization. He does not know what kind of a pull, but if he thinks that he, who has been faithful, is not getting his deserts, and another fellow goes up who has been on the job a shorter time than he has, then he feels it is not fair that he does not get a chance to go to the man who has the last say. He thinks the intermediate officials he can talk with are just straw bosses and buffers between him and the man who has the last say as to how many dollars a day he shall draw.

What he would like to do is to have a chance to present the case in some way to the fellow who has the last word. We do not want to take a chance with the foreman or superintendent putting the matter up to the big boss for us, because we could plead our case much better than he could. We do not want to hand our cases out to Tom, Dick or Harry, especially if we are a little bit suspicious.

The Question of Grievances

Consider for a minute the question of grievances. How many workers do you suppose there are right now in a concern that has no machinery for getting rid of grievances quick—how many workers out of ten do you suppose there are who have some grievances? I am going to bet you it is nine out of ten in any industry where there is no channel for discussion with responsible management of anything that is on the employees' minds. And I will also say that in a decently run concern only one or two out of those nine grievances will be sound and real. The others will be fancied or unfounded. But it does not matter whether they are actual or imaginary—they hurt just as bad.

The attitude of the worker as we see it has been this: Nobody is interested—he has been pushed out in the ante-room, he is not a member of the family, he is a servant, that is all. No one has told him, if there has not been a special effort made to do it, that industry today is a team-work proposition, where the management and the men have got to get together and work it out as a co-operative proposition in the interests of all. The average worker three years ago had no idea of that. He did not have any idea that his interests were more or less identical—substantially identical in the case of public service corporations—with the interests of the management, and that if the industry prospered, he would prosper; if it did not, it was necessarily going to be hard sledding for him.

Of course he does not realize it, in the first place because nobody told him and explained to him that those things are so. On the other hand, look at the people who are telling him that they are not so. Look at the people who are telling him that instead of having any common interest with his employer, he has nothing in common with him at all. Look at the people going up and down this country telling him that his interests are directly hostile to those of his employer—that he is being exploited by the capitalistic class. He may not know what "exploited" means, but what he does suspect is that somebody is trying to get the best of him. And if he has any fighting blood in him he is going to resist it.

The Danger Sign

Every unscrupulous politician and every yellow newspaper is preaching to him all the time, poisoning his mind against his own industry. His own people do not get together and tell him differently. Why wouldn't his attitude be one of indifference, of indifference to his job, to the bosses and to the management? I do not see how it could help be otherwise.

That is not the right kind of attitude to have. No industrial concern can live permanently with that attitude existing. We have a pretty good indication as to what it will mean. We are today somewhere near where England was 10 or 20 years ago. Unless we do something to check it we are headed to land about where England is today. I think we have seen the danger in time. You can look all over this country and see industry after industry that has made up its mind it is not going to follow the mistakes that have been made in England.

What are we doing to correct this attitude on the part of the man who works for wages? He has got a job which calls for team play. All the workers are members of the team. No one element in that team can prosper at the expense of another permanently and have the enterprise successful permanently.

This relationship between the workers and the management is not a horse trade; it is a partnership and it must be real if it is going to succeed. If it is a horse trade, sooner or later it is going to fall down. The interests are so essentially identical they must work together and not work apart if they are going to attain the objectives everyone is striving for. All the human ability in the company must be combined to work for a common objective, which is the success of the company.

How can it be done? In just one way. Every man in the company must want to make the enterprise a success, and be willing to do his share, whatever that may be, to attain that object. Now that is easy to say, but not quite so easy to bring about. There is no formula by which this can be brought about, or any definite program. It is a matter of dealing with human nature. It is not an exact science—it varies from day to day, it varies from industry to industry, and it varies in different departments in the same business.

The Four C's—Guide Posts

We have never been able to find any formula or program or panacea, but we have stumbled on a guide post. I am going to give it to you for what it is worth. We call it the four C's, and I will tell you what they are.

Contact—We start on the theory that one of the first things we have got to do is to get some *contact* between the management and the men. The men have been separated—separated geographically, and separated by an organization chart that starts with the president and by the time it gets down to the man in the ranks it is way down in the depths. He could not go up that steep ladder if he was a steeple climber. We have got to find some means to get the people together—the management and the men.

Conference—Getting them together is not enough. You

have got to get them acquainted, acquainted so they know each other. How do you get acquainted with a man? You do not get acquainted with him until you talk to him a little bit. He tells you what he thinks and you express an opinion and you size each other up and that is the way you get acquainted. You are not acquainted when a man says, "Mr. A, meet Mr. B." That is contact, but not acquaintance. We say you have got to have something more than contact, you have got to have *conference*, you have got to talk things over. That is the second C.

Confidence—Assuming you have a reasonably good bunch of people in the industry you are engaged in, if you talk together long enough and discuss things long enough and interpret yourselves to each other, that will inspire *confidence*. Then you are getting somewhere.

Co-operation—The minute the men have confidence in the management and the management begins to have confidence in the men—and you cannot have one without the other, because the men are not going to have a whole lot of confidence in a manager who does not know them—it is very easy to *co-operate* and that is the fourth C. That is team play. That is what we have got to have in industry.

We have found these four C's (*Contact, Conference, Confidence and Co-operation*) very good mile-posts or guide-posts in testing out different things that we have tried to do. In the first place, in order to bring about this different relation between the men and the management, we felt that we had to have some machinery. We did not have it. We did not have anything but an organization chart and it is true we used to say—patting ourselves on the back and thinking we were pretty good when we said it—"Why, the president's door is open to any man in the company." Yes, but how did he get to the president's door? He started climbing the organization step-ladder and every time he climbed a rung he was a marked man, and when he got to the president's door he had a lot of men waiting for him when he came out. He knew his chances. And we kidded ourselves for years that we were good fellows, saying, "The president's door is open for any man who wishes to come in." But he had a rough road to get there, and a rougher one in getting back.

Employee Representation

So we decided to have some additional machinery and we advised all of our companies to invite the employees to organize themselves in such a manner that the management in all grades would have some supplementary opportunity of meeting with and dealing with employees. We recognized that we had got to the point where we must talk this business over—this common problem of the communication business of the United States—not with hand-picked groups behind closed doors, but with representative groups of the whole gang.

The employees organized in various ways in each company. It is not a national institution. In some companies there is no connection between the employees' committees in the different departments.

This organization of employees, whatever form it may take, is not the end itself; it is simply the means to an end, that is all. The end—the objective—is harmony and co-operation—team play.

I am not going to discuss the question of employee representation because that is a long story in itself. But I do want before we leave the subject to give you some of the results of our experience.

There are four or five things about it we think essential or else the thing will be a failure from the start. One is to be absolutely sure that the chief executives understand the purpose of it; namely, that it is simply a means—the machinery—to get harmony and team play, and that they believe in that purpose. Too many executives right now are trying the idea for another purpose. The real purpose in the

back of their heads is to try to break an existing union. These efforts in my judgment are doomed to failure.

Candy in Sunday School

Another thing that should be borne in mind is that employee representation is not welfare work. I think "welfare" was a good word once, but there have been more crimes committed in its name than almost any other good word I have known anything about. Men do not want to be coddled. A certain amount of solicitude is all right, but the ordinary line of welfare work for men does not get you any further than you get when you pass out candy to a Sunday School. When they start licking it, it is all right, but after awhile the effect wears off and they get sick of it.

The next thing that must be borne in mind, if our experience is of any value, is that when the men organize on the invitation of the company it must be the men's own organization, not something that the company has a lot of wires in or that is run from the manager's or the superintendent's office. The men are too wise for anything of that kind, and wherever I have seen it tried that way it went dead and it was hard to start again. If the management wants confidence in the men, they should have enough confidence in them to say, "All right, organize any way you want. Then when you get it set up we will sit down with you and help you. But this is your hunt. We are going to find a way to live together in this industrial family from now on in peace." But let them start it.

The Hardest Proposition

Then here is the big, the great big proposition, and the hardest proposition in the whole thing. Every man in the supervisory line has got to believe in it, because they have all got to play a part in it and if they do not believe in it honestly it is not going to work.

Our experience shows everywhere, from one side of the country to the other, that just as soon as the management was ready to step up to the chalk line and say, "Now, boys, we are going to try and work this out with you," the men have been right there and have said, "All right, let's go to it." Don't worry about them.

I will give you a few reasons to support this statement. One is that there are many of these straw bosses, foremen and other first and second line supervisors—at least we found this to be the case in the telephone business—who had spent their lives on the job building up a kind of shield so that when the spotlight came down from above it would not show just exactly what was going on. Some of the most bomb-proof alibis had been erected that you could possibly imagine. Now, those fellows did not like the idea of having another spotlight turned up from the bottom, because they knew they would be shown up in about 15 minutes. I think we had in the neighborhood of between four and five hundred of them, who, when we got the spotlight on them from both directions were found wanting, and we found there had been a mistake made and had to put somebody else in those jobs. Another thing, there are lots of straw bosses who know today that there are men under them, right in their own ranks, who are twice as good as they are themselves and they hate to have anybody find it out, although they know it will be found out if there is any general mingling or getting together of the men and the management generally.

There is another reason why a lot of these men—I have been talking about the poor ones so far, but now I will talk about the good ones—good superintendents and first, second and third line supervisory officials, do not relish the idea of sitting around a desk or a table and talking things over with the men. Why? They don't know how. They don't know how to discuss wages or to defend a wage scale. They don't know how to defend working conditions. They do not know the policy of the company and they do not know how they

are going to explain this or that practice. The result is that they dread it.

An Embarrassing Situation

I remember very well when some of our people were starting out some years ago. Man after man said when they knew they had a committee of men coming in, "What will we say if they start to talk wages? These men will surely want to talk wages." Well the answer to that was, "If that is on their minds, let them talk." But we never told them how to discuss the question of wages, or the wage scale.

We found that not one out of ten of our supervisory officials below the grade of general superintendent knew how to analyze a balance sheet, or what the company's balance sheet really meant. Another thing about supervisory officials—a whole lot of them have got an idea that they are living in the last generation. There was a time in industry when it was considered to be the job of the boss to drive his men. That day has gone by, but lots of them don't understand it. Some managers in this country in industry have not waked up yet to the idea that this era calls for leaders.

Drivers versus Leaders

We saw it in the war. We saw the most highly organized machine, the most superlatively trained war machine, the best equipped war machine that has ever been put on the field in the German army. And we saw the officers try to drive their men through to victory. They were absolutely sure that they could drive them through. We got our men together in six months and we trained them hurriedly and took them over there with officers who were picked leaders, and who led them and licked the tripe out of the born soldier. And that is just exactly as true in industry as it is in war today. The great leaders in industry are quite different from the ones I have described, for they are real leaders, and there is no place left for drivers, not even among the straw bosses.

Must Be Double-Track

There is one more essential in employee representation. If it is going to be successful it has got to be a two-track proposition and not a one-track proposition. That is, you have got to have the stuff coming both ways. If it is just some kind of set-up where the men can come and air their troubles and their grievances and you have everything coming from them—all of their complaints, letting them get the stuff out of their systems—that only just starts it, that is all. That is a one-track proposition. The great big possibilities, the possibilities for doing the big job and changing their attitude is the second track, when the stuff begins to come the other way, from the management to the employees.

I would say that people were using the one-track method when they set up some kind of employee representation simply to clear the atmosphere, and that is all—to get the grievances in the open. They proceed on the theory, "How much help can we get from the general forces, from the rank-and-file if we let them finish up all their grievances, give them good wages, good working conditions and treat them right, but tell them nothing?"

Muscle—Brains—Will Power

The two-track proposition proceeds on another theory. What has a man got to give to the industry? He has three things. He has muscle. He has brains. And he has got the will power that drives his muscles and his brains.

Now, we have never in industry put any shackles on a man physically. We have let him put all the muscle he had into the job. We have assumed that he would give us all he had, every ounce, but we never have undertaken to mobilize all the brains that are available on the job. If a man in the ranks made a suggestion—Why don't you do it this way? Why isn't this a good scheme? Why not work it out that

way?—too often some straw boss has said to him, "You attend to your business, you are not paid to make suggestions."

Two men have told me that that is exactly what they were told when they had particular suggestions that they thought were very good. No, we have not mobilized the brain power. But the two-track proposition, if you are going to let things come from the management—that is, if the management is going to ask for suggestions, talk things over, talk about its problems—then they are proceeding on a theory of, not how much help are we going to get from these fellows, but how are we going to let them help.

The Real Trouble

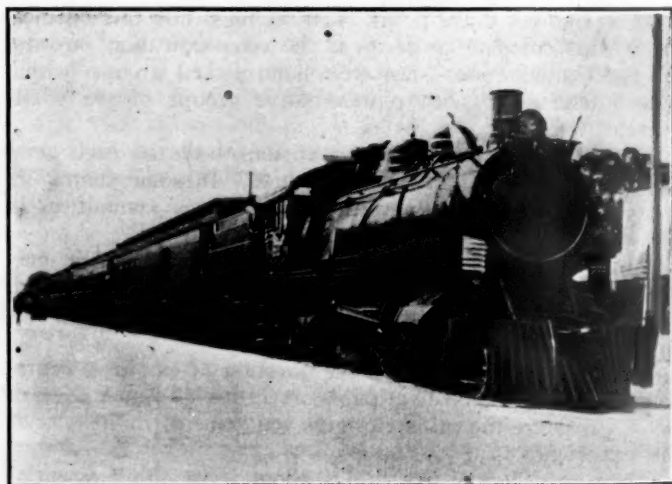
In the last analysis we think that the real trouble with the laboring man in this country is that he feels he has lost his place, lost his status in industry. The industry has got so big and he is so far from headquarters that he reckons he doesn't count except in the total figures—so many linemen, so many spicers, two hundred switchmen, four hundred colliers, etc., etc. He feels lost in the shuffle, he has no recognized place but is just one of a big bunch, one of the herd; and that hurts his pride.

We believe in making every man feel he is an important member of the family. We intend to help him get interested in his job, believe in his boss, swear by the company he is a part of, know what its policies are and why they are adopted, and know what the rules are and why they are made, and appreciate the part he plays in the organization; like it; like the whole outfit.

The Goal

If we could get all workers in that frame of mind we should have such peace in industry as we have never dreamed of, and production unprecedented.

May I say this to you? If we could get the whole-hearted co-operation, respect and belief of all the people concerned with communication and transportation, we would be doing this country a greater service than we are when we are giving the services of transportation and communication, even. If we could bring that about it would have a wonderful effect; it would steady the situation, and the industrial problem would be on its way to a solution. You are the biggest industry by far in the United States. If you could find the answer along these lines, why, everybody else would give it a trial. I wish you God-speed and hope you will find the way and get it across just as quickly as human energy and resourcefulness can bring it about.



Underwood & Underwood

A. Spick-and-Span Locomotive at the Head of President Harding's Special Train on the Florida East Coast

"Peg" System Expedites Freight Train Movement

Adherence to Tentative Schedules Reduces Average Time
Over Division by More Than an Hour

A "PEG" is a non-time table schedule for a tonnage train. The peg system is the provision of pegs for *all freight trains*. The peg system has been in operation on the Buffalo, Rochester & Pittsburgh since 1916 and has resulted in savings of from one to two hours in moving trains over engine districts approximately 100 miles in length.

The B. R. & P., it may be well to point out, is primarily a bituminous coal road. Most of its coal originates in the territory north of Pittsburgh and moves northward to connections with east-west lines and the lakes at Buffalo and Rochester, especially the latter. Mallet locomotives are used extensively and more have been ordered, 2-6-6-2's for road service and 2-8-8-2's for pushers. The absolute-permissive block system is in operation on the more important single track lines and has greatly facilitated train operation. No "31" train orders are used on sections so signaled. The "A.-P. B.," however, was installed before the adoption of the peg system and the accomplishments ascribed to the latter are in addition to those already attained by the former.

Works Well on Both Single and Double Track Lines

The B. R. & P. has a considerable mileage of single track and the system is in operation on both single and double track sections with equal success. Before the peg system was installed the officers of the company made schedules, or pegs, sufficient to handle maximum business. These pegs contemplated the best probable performance, barring accident, if all employees and all departments entering into train movement exerted their best efforts in this direction. For example, officers were stationed at water towers to time engines taking water. Under their surveillance the employees speeded up the operation as much as possible and it was this performance which was allowed for in the peg. If any crew uses more time in taking water than experience has shown to be necessary, a satisfactory explanation must be made. In making observations before installing the peg

system, the officers found that switching movements at one point were holding up practically all of their freight trains. With the publication of the pegs, however, these delays were reduced to a minimum, since it was the duty of the switching crew to clear the time of these pegs almost the same as of regularly scheduled movements.

How the System Saves Delays

The peg system has greatly simplified the work of the roundhouse forces because they know when they are going

FORM 305 B&P 3-30

BUFFALO, ROCHESTER & PITTSBURGH RAILWAY CO.

Conductor's Telegraph Delay Report of Train _____ Engine _____

19 _____ CONDUCTOR

STATIONS AT OR BETWEEN	NO. MINS. DELAY	CAUSE IN DETAIL

SEE INSTRUCTIONS ON BACK

Fig. 2—Conductor's Delay Report

to be called upon to deliver locomotives. Dispatchers are able to arrange meeting and passing points on a definite basis and are required to keep watch on irregularities only instead of every movement of every freight train on the road, as is necessary under the system of running all freight trains as extras whenever tonnage, power and crews are available.

THEORETICAL MOVEMENT OF TONNAGE TRAINS BASED ON PROPER OBSERVANCE OF SPEED RESTRICTIONS AND THE ELIMINATION OF AVOIDABLE DELAYS

NORTHWARD TRAINS

	A. M.	A. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	A. M.	A. M.	A. M.	A. M.	A. M.
.....Tied up.....	8:50	10:55	1:25	4:40	6:15	6:55	8:10	8:50	10:40	11:40	12:50	2:10	4:00	5:05	5:55
.....Lincoln Park.....	8:40	10:45	1:15	4:30	6:05	6:45	8:00	8:40	10:30	11:30	12:40	2:00	3:50	4:55	5:45
.....D. L. & W. Jct.....	6:25	8:36	11:04	1:58	3:35	4:24	5:50	6:25	8:21	9:06	10:28	11:47	1:44	2:43	3:58
.....Gainesville.....	5:10	6:54	9:28	12:39	2:07	3:10	3:47	4:27	6:23	7:21	8:25	9:36	11:38	12:57	2:10
.....Bliss.....	4:48	6:32	8:41	12:14	1:45	2:47	4:05	4:50	6:45	7:42	8:47	10:13	12:30	1:20	2:27
.....Farmersville.....	4:17	6:00	8:06	11:39	1:10	2:12	3:17	3:55	5:24	6:48	7:50	9:08	11:01	12:19	1:47
.....Ashford.....	3:20	5:00	7:10	10:46	12:05	1:12	2:20	3:00	4:20	5:47	6:48	8:10	9:50	11:19	1:08
.....East Salamanca.....	2:05	3:45	5:50	9:20	10:50	11:45	1:05	1:50	3:05	4:32	5:45	6:45	8:35	9:55	12:15
.....Ordered.....	12:55	2:35	4:40	8:10	9:35	10:35	11:55	12:45	1:55	3:20	4:45	5:35	7:25	8:45	10:45
.....Time of trip.....	7:55	8:20	8:45	8:30	8:40	8:20	8:15	8:05	8:45	8:20	8:05	8:35	8:35	8:20	7:10

SOUTHWARD TRAINS

	A. M.	A. M.	A. M.	A. M.	A. M.	A. M.	A. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.	P. M.
.....Ordered.....	12:15	1:15	2:40	4:00	6:15	7:45	9:00	11:35	1:15	2:55	4:15	6:25	8:05	9:20	10:35
.....Lincoln Park.....	12:15	1:15	2:40	4:00	6:15	7:45	9:00	11:35	1:15	2:55	4:15	6:34	8:05	9:20	10:35
.....D. L. & W. Jct.....	2:20	3:23	5:00	6:05	9:13	10:23	11:40	1:44	3:35	5:14	6:36	8:21	10:28	11:47	12:55
.....Gainesville.....	3:53	5:10	6:54	7:35	11:08	11:52	1:25	4:05	5:37	7:42	8:47	9:27	12:13	1:20	3:19
.....Bliss.....	4:13	5:29	7:30	8:00	11:25	12:14	1:45	4:27	6:00	8:01	9:06	9:36	12:20	1:39	3:42
.....Farmersville.....	4:39	6:00	8:06	9:27	12:05	12:42	2:12	4:54	6:48	8:40	9:45	9:58	1:15	2:29	4:17
.....Ashford.....	5:24	7:10	8:52	10:12	12:48	1:45	3:00	6:11	7:28	9:25	10:40	10:27	2:15	3:20	5:00
.....East Salamanca.....	6:30	8:05	9:50	11:25	1:50	2:45	3:45	7:25	8:15	10:30	11:25	11:05	3:05	4:10	5:45
.....Tied up.....	7:00	8:35	10:20	11:55	2:20	3:15	4:15	7:55	8:45	11:00	11:55	11:35	3:35	4:40	6:15
.....Time of trip.....	7:10	8:45	10:30	12:05	2:30	3:25	4:25	8:05	8:55	11:10	12:05	11:45	3:45	4:50	6:25
.....Time of trip.....	6:55	7:30	7:50	8:05	8:15	7:40	7:25	8:30	7:40	8:15	7:50	5:20	7:40	7:30	7:50

Time consumed at or between designated stations in excess of time shown will be considered delay, and must be explained on delay reports.

Fig. 1—Pegs in Use on the Rochester Division

This report is made on a ruled sheet 15 in. by 42 in. The illustrations making up Fig. 4 do not portray the whole report but only the upper part of it. For purposes of adequate

Fig. 3—Dispatchers Fill Out One of These Forms for Every Freight Train Moving Over Their District

The peg time between stations shown in Fig. 4 is *average* peg time. The actual peg time between the stations varies with each train. The peg time for the entire trip, however, is shown in the last column of the first illustration by in-

Train No.	Class of Service	ROAD ENGINES		FROM	TO	ENGINEER	CONDUCTOR	TIME CONSUMED BETWEEN																Time Ordered to Depart	Time Tied up at Destination	Time of Trip To Time Tied up	Overtime of Trip	Pay Time of Trip													
		Class	No.																																						
A	B	C	D	E	F			E. Lala	Ashford	F. Bell	Bless	Goalle	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	W. P. L.	Hrs.	Min.	A. M. P. M.	Hrs.	Min.	A. M. P. M.	Hrs.	Min.	Hrs.	Min.	Hrs.	Min.			
32		Z	418	E. Lala	Ph.	Mc. Kelley	Lapping	1	40	54	37	42	1	46	1	31												10	45	P	6	25	Q	7	40	-	-	7	10		
1/22		Z	407	-	-	Harle	Mc. Tarneder	1	00	1	34	54	1	24	1	25	2	08										8	05	Q	5	00	P	8	55	55	8	30			
2/22		Z	425	-	-	E. Mooney	D. Angelo	1	08	1	13	45	1	01	1	18	2	10										9	35	Q	5	15	P	7	40	-	-	8	40		
3/34		X	389	-	-	J. S. S. S.	Moore	1	04	1	33	1	00	2	05	2	13	2	50									12	25	Q	11	40	P	11	15	3	15	8	15		
3/34		Z	400	-	-	J. S. S. S.	Beavertown	4	5	1	14	39	1	27	1	51	2	03										2	15	P	10	23	P	8	08	08	8	45			
2/8		Z	432	-	-	F. S. S. S.	Leysaam	5	2	2	44	52	1	18	1	36	2	05										7	35	P	5	11	Q	9	36	1	36	8	35		
3/30		Z	412	-	-	Wells	Smith	1	25	1	02	58	1	18	1	45	2	31										2	35	Q	12	14	P	9	39	1	39	8	20		
						Total	Time	7	54	10	14	5	45	9	15	11	54	15	18																						
						Average		1	08	1	28	49	1	19	1	42	2	11																							
						Per		1	14	1	13	58	1	01	1	31	2	11																							

Train No.	DELAYS IN MINUTES BY																																						Train No.	ASSISTING ENGINE	FROM	TO			
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35	D36	D37	D38		Class	No.				
32																																													
1/22	20								2	22					10																														
2/22																																													
3/34	30								5	45																																			
2/28																																													
3/30	40								2	20		2	25																																
	50	40							9	87		3	40		10																														
																															</														

Train No.	E. Lala Ashford Ashford Goalle								BETWEEN Goalle Warsaw				Warsaw P. L. Jet				P. L. Jet L. Park							
	CARS				TONNAGE				CARS				TONNAGE				CARS				TONNAGE			
	LEADS	Emp- lies	Actual	Railing	LEADS	Emp- lies	Actual	Railing	LEADS	Emp- lies	Actual	Railing	LEADS	Emp- lies	Actual	Railing	LEADS	Emp- lies	Actual	Railing				
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20				
32	22	3	1135	1625	34	3	1695		29	3	1525		27	3	1445		26	3	1415	1625				
22	46	0	2765	2750													—	—	—	2750				
22	27	1	1620	1625					23	0	1335						23	0	1325	1625				
34	45	10	2730	2750					36	10	2138		11	10	859		—	—	—	2750				
34	26	0	1622	1625									29	0	1742		3	0	120	1625				
28	50	2	2768	2750	48	2	2634										48	2	2634	2750				
30	22	18	1629	1625					21	11	1408						21	0	1166	1625				
	238	34	14269	14750													121	5	6670	14750				
	34	5	2038	2107													17	1	953	2107				
		</																						

These three illustrations when placed side by side portray the upper part of a 15 in. by 42 in. sheet upon which the performance of all trains is recorded. That part of the report shown here covers northbound movement of freight trains, except locals, on the Rochester division on January 31, 1923.

Fig. 4—Report of Freight Train Performance—Delays Explained in Detail on Portion of Report Not Shown Here

STATEMENT OF IRREGULARITIES—ROCHESTER & BUFFALO DIVISIONS. MECHANICAL DEPARTMENT. JANUARY 31, 1923

1/22 eng. 407 E. Salamanca 10 mins. engine late.
 1/34 eng. 389 E. Salamanca 30 mins. engine late.
 No. 28 eng. 432 Bird 25 mins. hot box NYC 403657-CGN 27864.
 No. 30 eng. 412 Gainesville 15 mins. hot box GT 75684.
 No. 21 eng. 414 SL Jct. 47 mins. low steam and stoker trouble.
 Ex. 403 Warsaw 72 mins. truck broken under BR&P 44237.
 No. 33 eng. 435 WS Jct. 45 mins. switch out NYC 412411 tight brake connection and make four couplings on train.
 Ex. 429 WS Jct. 30 mins. PRR 350813 leaky train line; Mile Post 102-20 mins. brake beam down NYC 414441.
 No. 27 eng. 406 Buffalo Creek 10 mins. engine late, 20 mins. air men.
 1/26 eng. 406 E. Salamanca 20 mins. air men.
 2/45 eng. 417 Riceville 30 mins. train parted acct. low draw head DH 100215.
 2/50 eng. 377 E. Salamanca 15 mins. engine late; E. Salamanca to Ashford 20 mins. low steam engine 377.
 1/52 eng. 401 Great Valley to Ashford 30 mins. No. 132 ahead with low steam engine 603; Mile Post 33-25 mins. stoker trouble engine 401.
 No. 22 eng. 401 Buffalo Creek 35 mins. engine late; Glenwood 50 mins. draw head out C of Ga. 51159.
 2/54 eng. 402 Beaver 20 mins. hot box SVE 22856; E. Salamanca 20 mins. repairs to caboose.
 No. 27 eng. 402 Buffalo Creek 20 mins. engine late.
 E. J. DEVANS, General Superintendent.

STATEMENT OF IRREGULARITIES—ROCHESTER & BUFFALO DIVISIONS. TRANS. & M. OF W. & S. DEPARTMENTS. JANUARY 31, 1923

1/34 P&L Jct. 40 mins. setting off.
 No. 28 Brooks Ave. 30 mins. setting off.
 No. 30 E. Salamanca 40 mins. train not switched; P&L Jct. 30 mins. setting off.
 No. 21 Lincoln Park 40 mins. engine called late; LeRoy 35 mins. picking up; DL&W Jct. 30 mins. picking up and setting off.
 Ex. 403 WS Jct. 80 mins. picking up; DL&W Jct. 80 mins. cut and went to Warsaw for water acct. no water at DL&W Jct.
 No. 33 WS Jct. 45 mins. switch out NYC 412411 tight brake connection and make four couplings on train.
 No. 25 P&L Jct. 35 mins. picking up and setting off.
 Ex. 429 WS Jct. 50 mins. picking up; E. Salamanca 20 mins. yard blocked.
 No. 29 Brooks Ave. 30 mins. picking up; E. Salamanca 15 mins. yard blocked.
 No. 27 Buffalo Creek 20 mins. train not switched.
 1/26 Kellogg 10 mins. trackmen.
 1/45 Buffalo Creek 35 mins. train not switched, 10 mins. pick up head end; E. Salamanca 50 mins. yard blocked.
 2/33 Buffalo Creek 90 mins. train not switched.
 No. 47 Tift St. 20 mins. train not switched; E. Salamanca 25 mins. yard blocked.
 1/52 E. Salamanca 20 mins. blocked by yard engine 279-526.
 No. 23 Buffalo Creek 15 mins. train not switched.
 E. J. DEVANS, General Superintendent

Fig. 5—Daily Statement of Delays to Departments Responsible

Railway Officers Discuss Locomotive Terminals

Meeting of the Western Society of Engineers at Chicago Devoted to the Problems of Engine Facilities

AS A FEATURE of engineering week in Chicago, simultaneously with the conventions of the American Railway Engineering Association and the Signal division of the American Railway Association, a meeting was held under the auspices of the Western Society of Engineers on Tuesday, March 13, to discuss problems of locomotive terminal design. These were presented from the standpoint of the mechanical and the operating officer respectively, by

L. K. Sillcox, general superintendent of motive power, Chicago, Milwaukee & St. Paul, Chicago, and R. N. Begien, general manager, Baltimore & Ohio, Western lines, Cincinnati, Ohio, while the problem from the standpoint of the designer was presented by W. T. Krausch, engineer of buildings, Chicago, Burlington & Quincy, Chicago. Abstracts of the papers presented by Mr. Sillcox and Mr. Begien follow, while Mr. Krausch's paper will be presented in a later issue.

A Mechanical Man's Views on Engine Terminals

By L. K. Sillcox

General Superintendent of Motive Power, Chicago, Milwaukee & St. Paul, Chicago

FROM THE STATISTICS compiled for all railroads in the United States, it has been determined that in every 24 hours, the average serviceable locomotive is used a little less than 8 hours in actual road service. This figure gives no consideration to the fact that the average annual locomotive service days range from 300 to 330 days out of the 365 days of the year, or only about 80 per cent. Therefore, of the total complement of locomotives owned, approximately 80 per cent are serviceable throughout the year and of the 80 per cent serviceable, only 33⅓ per cent of the actual hours in service are utilized so that the net amount of service obtained is only approximately 28 per cent of the total.

Therefore, since the engine is in service an average of only eight hours out of each 24, the inference is that the remaining 16 hours are consumed at the terminals in conditioning the engine for another trip and holding it awaiting call. It would appear that these 16 hours represent a tremendous waste of time and that earnest endeavor should be made to recover it for revenue service. However, consideration should be given to the fact that a certain amount of this time is absolutely necessary to prepare the engine for service.

Four Operations to Be Considered

The circular chart shows the distribution of the 24 hours of the average serviceable locomotive day. From reports of enginehouse performance, it has been determined that the average serviceable locomotive is turned approximately 1.4 times in every 24 hours from which information, it can be assumed that the average time required to turn an engine is about 11½ hours. For this reason the 16 hours of terminal detentions have been divided on the chart and 11½ hours indicated as representing one complete engine turning with the remaining 4½ hours considered as a portion of the next turning. An analysis of the various operations constituting an engine turning in the usual sequence of their occurrence indicates a grouping into four main divisions. These divisions, with the average approximate time element of each, are as follows:

Movement of the engine from the train to the engine terminal	¾ hour
Roundhouse care and ordinary repairs	8 hours
Extraordinary repairs and awaiting call	2 hours
Movement from outbound track to train	¾ hour

The first division represents the time consumed in releasing the engine from road service and in delivering it to the engine terminal, or in other words, what is usually termed outside hostling. The time element of this division is a

function of the terminal layout and will depend upon the relative location of the engine terminal with respect to the train yard and the track arrangement leading into the engine terminal.

The several operations constituting the second division, when taken in their usual sequence average approximately as follows:

A.—Removing supplies, outside inspection, and knocking fires	1 hour
B.—Movement from cinder pit into roundhouse stall	¼ hour
C.—Inspecting, repairing, cooling down, and washing boilers and tanks	2½ hours
D.—Wiping, completing repairs and filling boilers	2½ hours
E.—Building fires and steaming up	1 hour
F.—Movement from roundhouse to outbound track, taking coal, water, sand, and supplies en route ..	¾ hour

Total

8 hours

The third division is necessary to provide a period for overlapping to take care of extra repairs and to compensate for slow operations at points where sufficient facilities are not available for the prompt turning of power. It also allows for the margin of time between when the engine is ready and when actually put into service. This division, therefore, bears a joint responsibility of the mechanical and transportation departments, as these detentions are the function of the speed of terminal performance and the utilization of power.

The fourth division represents approximately the average time consumed in handling the engine by the engine crew or an outside hostler from the engine terminal to the train yard after the engine has received coal, water, sand, and supplies. As with the first division, the time element of this is also dependent upon the location of the terminal and the track layout leading from the terminal to the yard.

Thus a medium of measure is established for comparison. However, it cannot be applied literally, for it represents a collective result and should be made by grouping terminals either by divisions or districts. This becomes apparent when considering supplementary roundhouses where no machine shop facilities are available as against the major terminal which is well-equipped for making heavy repairs. The former merely constitutes a turn around point where the engine is turned and provisioned, while at the latter, the attention received will be more extensive and will include repairs so that it would not be fair to compare the one with the other merely on the time element basis. The combined result of the two, however, could be compared equitably with the results as indicated on the chart.

There are four fundamental factors relating to the proportion of time in service and out of service:

1. Mileage and time between terminals.
2. Demand for power.
3. Terminal layout and the location with relation to the train yard.
4. Facilities for conditioning engines for service.

Length of Engine District a Factor

From observations made of the performance on various railroads, especially when making a study of enginehouse expense, it appears that there are various basic elements which affect such performance, among which can be considered the average miles between engine terminals. A study of eight carriers reveals that the average distance between terminals ranges from 57 to 114 miles. It is found that each cost varies inversely with the miles between the terminals. In other words, the greater the distance between terminals, the less is the cost of turning engines per train mile. Too much stress cannot be placed upon the location and spacing of engine terminals. In the spacing terminals, however, consideration should be given to mileage and time as affecting the scheduling of train crews, as otherwise any gain made in the saving of enginehouse expense may be offset by overtime incurred by the train crews.

These studies also indicate that there is a great variation in the frequency of turning engines. This depends upon the distribution of power according to the demand, the amount of power owned in proportion to the volume of traffic, and most important of all, the frequency of terminals. When there is a large number of power units, but a great frequency of terminals, short runs will prevail, whereas if the runs are longer the number of service hours per day will increase, the dead time at terminals will be reduced, and the gross ton miles will increase with a consequent increase of earning power per locomotive. The spacing of terminals has an effect on the serviceable hours per day, but this should not imply an advocacy of unnecessarily long runs or the skipping of terminals, but rather the providing of a rearrangement that will give a more uniform distribution of terminals so as to reduce the amount of terminal handling to a minimum consistent with the volume of traffic.

The question of margin of power is also very vital and must be considered before any step is taken at any one terminal to improve it out of proportion to the neighboring terminals. As an illustration, there may be an engine terminal where there are from 20 to 22 engines in the house at all times with an average of only eight departures and eight arrivals in the 24-hour period. In such a case, the dead time proportion of the 24 hours would be very large and would require a relatively small force to operate the terminal and possibly permit the use of two instead of three shifts. On the other hand, there may be an engine terminal with only 12 engines in the house at all times and with an average of 10 arrivals and 10 departures every 24 hours. Here operation would be more intensive, requiring a relatively large force, possibly three shifts, and with facilities which would permit the turning of power in less than 8 hours so as to be in a position to overcome any emergency.

The relative location of the terminal with respect to the yard and depot is a factor affecting Divisions 1 and 4 of the chart. If the terminal is close so that the engine may be uncoupled from the train and delivered directly to the engine terminal, only a few minutes will be involved, but if it is a long distance away or the movement involves complicated switching, the time loss becomes a large item.

Influence of the Track Layout

The layout of the tracks leading to the terminal and within the terminal greatly influences the time element. The layout should be flexible and allow for free and unencumbered movements in proper sequence. There should be no interference between inbound and outbound movements. Coal and water facilities should be provided in such a way as to serve both inbound and outbound tracks, with greater ca-

capacity for the outbound engines. Outside facilities should be provided with due consideration to climatic conditions. Sufficient well-disposed artificial light should be furnished. Cinder pits for ample and reliable service are necessary. Where the volume of traffic is large, outside covered inspection and repair pits are of great value in speeding up the movement of engines through the terminal.

It would appear, therefore, that there are two avenues open for the study of means to improve the situation with the view to reducing the amount of time involved in terminal detentions with the consequent increase of time in road service: One is to establish fewer and more properly spaced terminals; the other to provide adequate facilities for turning and repairing locomotives. Referring again to the chart, by the proper spacing of terminals with a consequent reduction in frequency of terminals and lengthening of runs, the tendency would be to produce longer hours in service. If terminal facilities are available and the proper demand for power prevails, there will be a reduction in the time required at the terminal as represented by Division 3.

Regardless of the adequacy of any engine terminal, it cannot be expected to perform to its full capacity without proper management. In order to have a well-managed plant it is necessary for the men in charge to have a well-defined knowledge of every operation, considering time, capacity and cost. A diagram shows the relative costs of the various operations constituting an engine turning exclusive of repairs. With such information, the man in charge should be able to regulate his output and expense in such a way as to operate his terminal economically and efficiently. The various elements constituting the several groups selected are as follows:

Supervision—Pro rata portion of salaries and expenses of foreman and clerks.

Engine handling—Outside and inside hostling, watching outside of house, calling crews, drying sand and provisioning.

Cleaning fires and wiping—Knocking or cleaning fires, ash pits, etc., and wiping engines and tenders.

Washing boilers, tanks and water changes.

Cleaning flues—and inside of front ends, fire boxes, brick arches, draining and cleaning air reservoirs and air equipment.

Inspecting front ends and ash pans.

Oiling and packing—labor only.

Building fires and watching in house.

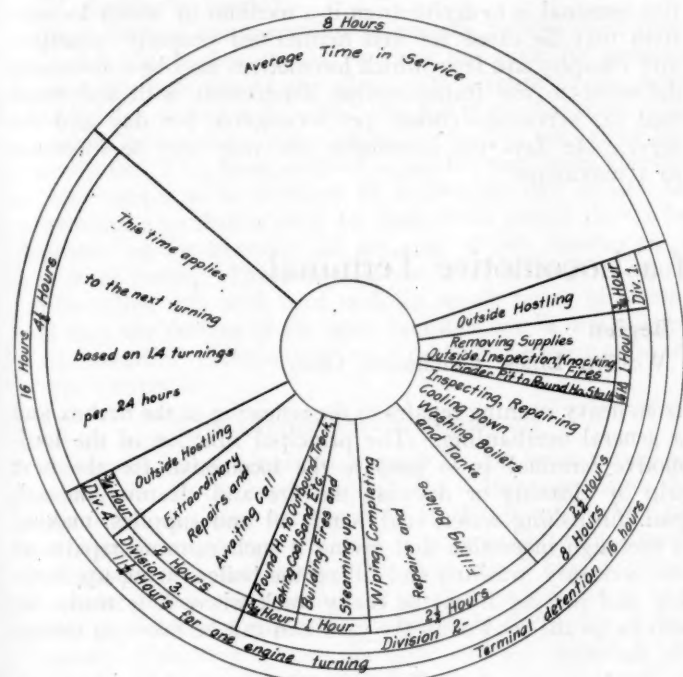
Enginehouse cleaning.

Note that the cost of handling engines represents 31 per cent of the total cost of turning (exclusive of repairs). This element is not within the full control of the men in charge. It is represented partly by Divisions 1 and 4 of the chart, and rather reflects the relative location of the terminal layout with the train yard. The cost of cleaning fires and wiping engines, which in this case is about 25 per cent, reflects the efficiency of the cinder pit operation, which is one of the operations that should be so arranged as to have proper facilities to keep the time and cost down to a minimum. The cost of boiler washing represents 9 per cent of the total, due to the fact that boilers are washed on an average of once every four or five trips. This expense can be materially reduced with hot water boiler washing equipment, and in addition such equipment will reduce the time required for this operation.

To the mechanical man, the engine terminal is a facility, or in other words, it is merely a tool with which to perform a specific operation in detail. It is a double-edged tool as there are two functions to perform. The first is the ordinary handling and care of the individual locomotive in the roundhouse, and the other is repairs, both lighter classified and running. In the well-ordered performance of locomotives, it is necessary to divide the maintenance into running and classified repairs. The running repairs must of necessity be made in the roundhouses. It has been the usual practice to do the classified repairs in the back shops, but there is an in-

creasing tendency to do the lighter classified repairs as well as the running repairs in the roundhouses in order to get a more intensive use of the power. It is the custom among some carriers to assign a certain mileage for a locomotive to perform between classified repairs, and in order to operate locomotives at a minimum cost per mile, for all classes of repairs, it is necessary to obtain a consistent balance between the cost of classified repairs and repairs made in the roundhouses. The manner in which roundhouses are equipped with repair facilities determines the balance.

It is the practice on many lines to send locomotives to the back shop only when in need of heavy boiler repairs, taking care of all other work as due in the roundhouses. It is a function of the roundhouse, therefore, to obtain from the



Distribution of the 24 Hours of the Day for the Average Serviceable Locomotive

locomotive a specified performance in mileage and time, and to see that every engine leaves the terminal in proper condition to insure a successful trip.

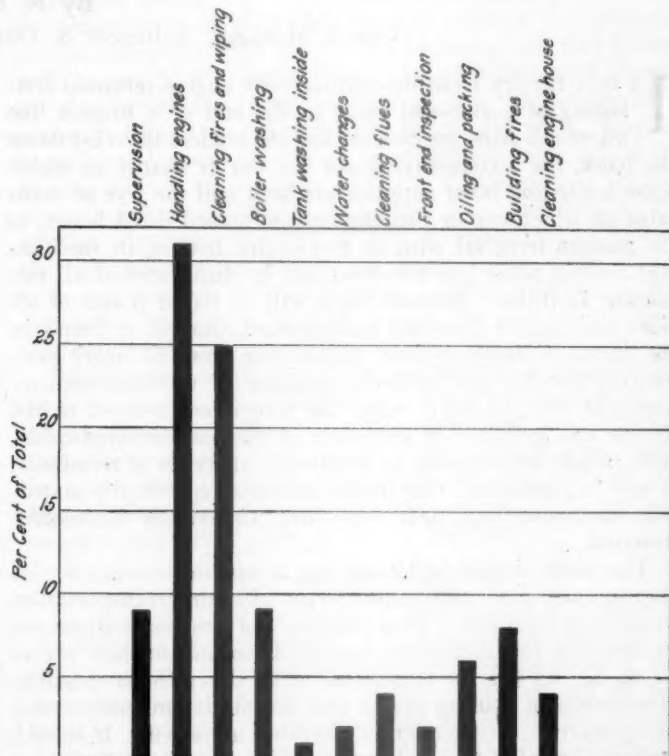
Much of the Repair Work Is Done at the Roundhouse

The roundhouses usually perform maintenance work on locomotives to the extent of approximately 40 to 50 per cent of the total cost of repairs and should, therefore, be equipped with this in mind. Any ratio ranging from 60 per cent for classified repairs to 40 per cent for running repairs on the one hand or from 50 per cent for classified repairs to 50 per cent for running repairs on the other hand would seem practical. The ratio between the cost of repairs done in roundhouse and back shop depends largely upon the policy pursued with respect to the amount of work expected from the roundhouses.

As was mentioned at the beginning of this paper, the average locomotive produces annually from 300 to 330 serviceable days out of the 365 days of the year. The opportunity for producing higher efficiency in serviceable days per year obtains from the ability to keep the locomotive within the jurisdiction of the local man and this can best be done by providing him a well-selected supply of standard repair parts and materials, and with ample facilities with which to make prompt replacements and repairs when due, thus eliminating delays occasioned in waiting for parts and materials from the main shops, or in transporting the engine itself to the main shops for repairs.

It is more difficult to maintain the larger units of power that now predominate than it was to care for the smaller engines that were in use in the past. The modern engine is heavier and more complicated, and requires more consistent and frequent mechanical attention. The various parts of the locomotive are larger and heavier and cannot be repaired quickly, if adequate facilities are not at hand with which to handle them. Generally speaking, the increase in the capacity and extent of facilities in roundhouses has not kept pace with the increase in number and size of power units, and until this is brought to a proper balance, it cannot be expected that the full serviceability of the modern power will be attained. A modern locomotive represents a large capital investment and idle hours are of a relatively greater loss than in previous years.

In order to illustrate the general situation on a large railroad system, it is necessary to know just how the various divisions range as to the volume and density of traffic. This forms the knowledge necessary to understand the proper assignment of power to divisions after considering track gradients and curvature, and other operating features. A high performance in car miles per day is not obtained by train speed, but by the promptness with which trains are broken up, assembled, and moved through terminals. A terminal should be prepared to handle without delay any reassignment of power for seasonal loading or other rea-



Relative Labor Costs of Various Operations in Engine House Expense

sons. Improved engine facilities should be made with consideration of the general situation, strengthening the weaker points first and thereby building up to a higher general efficiency.

An Ideal is Unattainable

There is no such thing as an ideal engine terminal, or an ideal terminal operation. From the very poorest to the very best they are a compromise. There are so many circumscribed elements affecting each point that no matter whether it was built up by gradual expansion or is constructed new, the final layout will always reveal some undesirable features. Financial stringency will retard develop-

ment and restrict new construction. Precedent hampers relocation of existing facilities. A good labor market often overbalances other advantages and designates a location that is geographically or otherwise improper. So we must compromise and use to the best advantage what we have and that which we can obtain.

We are confronted with the problem of not only creating modern terminals in new locations but of overcoming a situation that has developed gradually with the growth of the railway property. Terminals constructed in new locations can easily be equipped with all the proper and modern facilities required for economical and prompt handling of power, but it is more difficult to rearrange existing facilities than to construct new ones and it is this feature of the work which will require our attention for many years to come.

To illustrate the importance of improving engine terminal facilities and relocating them to reduce the time element per engine turned and the frequency of turnings: The average cost of turning power is now approximately \$6 to \$8 per engine turning and the average number of turns is 1.4 per

serviceable locomotive day. A revision of facilities that, by reducing the time element of turning, would produce a reduction of 50 cents per engine turned and reduce the frequency of turning 0.1 turning per day (say from 1.4 to 1.3), will accomplish an annual economy on a complement of 2,000 locomotives to the extent of approximately \$650,000, an amount that would pay interest at 5 per cent on \$13,000,000. Such an appropriation, properly distributed over the system, would provide for a great many time-saving features which, if utilized advantageously, would produce large returns on the investment and at the same time recover many serviceable locomotive hours to revenue service.

What the mechanical department expects from the locomotive terminal is to derive from it a medium by which locomotives may be cared for and maintained properly, promptly and cheaply, and from which locomotives may be consistently delivered to the transportation department with the result that the serviceable hours per locomotive per day and the serviceable days per locomotive per year may be increased to a maximum.

Operating Requirements of a Locomotive Terminal

By R. N. Begien

General Manager, Baltimore & Ohio, Western Lines, Cincinnati, Ohio

IT IS A far cry from the rudimentary engine terminal consisting of a stub-end track at the end of a branch line where ash pans are cleaned and the cinders shoveled down the bank, the accompanying old box car or shanty in which some waste and other supplies are kept and the wye or turntable on which one or two engines are turned in 24 hours, to the modern terminal with its two engine houses, its mechanical coaling plant and ash-hoist and its duplicates of all important facilities. Between them will be found plants of all sizes and types. The real battleground, though, is found in the plants of moderate size, dispatching from 50 to 60 locomotives per day and with the promise of ultimate requirements of 100 per day. Since the principles involved in the design and operation of terminals of this size are applicable, with proper adaptations, to practically all types of terminals, it will be understood that unless otherwise specifically stated, this discussion will deal with such an average locomotive terminal.

The plant should be located for maximum convenience of ingress and egress with respect to the adjoining transportation yards and facilities. This implies that minimum distances be involved for locomotives moving from and to their trains in so far as this is compatible with the greatest possible elimination of fouling points and the minimum interference of locomotives, switch engines and other movements. It should be borne in mind that a locomotive and crew is worth about 20 cents a minute and every time a minute is saved which otherwise would have been lost, reasons why it will not be necessary to buy more power are being accumulated. If it were possible to so design a layout that a locomotive could move from the head-end of a train to and from the coal dock, ash pit and roundhouse without interfering at any point with other work being done in the terminal, it would save the railroads so many engines that they could afford to spend a great deal of money to accomplish this.

Locomotive terminals are designed and constructed for the purpose of placing in the hands of the transportation forces a supply of locomotives in good condition and ready for service adequate to meet the demands of the operating department in conducting transportation and it is important to determine the things which must be accomplished in order to do this. The locomotive terminal is not to be confused with the locomotive repair shop. In the shop, locomotives are repaired and rebuilt. The amount of work done ranges

from heavy running repairs to the renewing of the firebox and a general overhauling. The principal function of the locomotive terminal is to prepare the locomotive for the next trip by cleaning or drawing the fire and cleaning the ash pan, furnishing water, coal, sand, oil and supplies, making a thorough inspection and giving it such running repairs as are necessary, washing and filling the boiler, firing up, turning and placing it on the ready track where it is ready for service on the road or in the yard and can be taken in charge by the crew.

Must Provide for Orderly Operation

It is essential that each of these operations should proceed in an orderly manner and in such a way that no one of them will limit the speed of operation of the terminal. It is not possible to exaggerate or lay too great emphasis upon the importance of so designing a terminal that one operation will not interfere with another. If one operation depends on another for its success, unless the one is a success the other is a failure.

To secure the best and most efficient use of a locomotive terminal it should be designed in such a way that while the various parts function in connection with each other and the operation of the entire plant may be conducted at a uniform rate, yet each facility should be independent of the others to such an extent that if any one unit should fail, it would not have the effect of stopping or seriously retarding the operation of the plant.

In the locomotive terminal, the demands vary from month to month, from day to day and from hour to hour, during each day, and it is necessary that each link in the operation have a large factor of safety, even for the estimated peak load. Few operations can be conducted efficiently for any length of time if the facilities are strained to the limit. Just as a bridge may be maintained at a low cost for many years, if it is never overstrained, so an ashpit may be operated economically if it is not worked to the point of congestion or overload.

Each of the above mentioned operations usually requires a separate facility which forms, as it were, a link in the chain of operation of the terminal. In connection with the design of these facilities, attention is called to the fact that each unit should be able to do at least double the work ordinarily required and in important terminals the plant should, as far

as possible, provide for duplicate facilities so as to avoid interference to operation should any link in the chain fail to function properly.

An ideal condition is to have a schedule for each operation and then to design each of the facilities in such a way that it will perform its allotted part on the total operation within the standard time. For example, if it be found that a locomotive could be allowed five minutes in which to take water, it would be necessary to provide apparatus which would deliver from 7,000 to 10,000 gal. of water in about three minutes. Then, with the number of locomotives to be handled in the maximum day, the size of pipe, capacity of storage, size of water columns, etc., can be computed. If five minutes were allotted to the taking of coal, the size of the chute, capacity of bins, capacity of hoisting apparatus and other dimensions could readily be figured.

Since some of the operations necessarily require more time than the others, they should be made the basis for proportioning the facilities of the plant. On account of the time required for cleaning fires and ash pans, the fire-track will doubtless be found to be the governing facility outside of the roundhouse. This being decided upon, the maximum number of locomotives to be handled in a 24-hour day should be determined and then a peak for some short period should be assumed; as for example, 25 per cent of this number in a four-hour period. The design of the ash pit should provide for handling this peak load with an ample factor of safety, and then the designs of the other facilities can be worked out with capacities corresponding to or somewhat exceeding those of the fire-track.

The Cinder Pit is Important

In small engine terminals a small bucket hoist makes an economical ash pit operation, but for a large operation the water pit is the most satisfactory. In designing a water pit care should be taken to see that it is provided with a cover so that men will not drown in it; that it will have a proper crane for handling the ashes. The principal objection to a water pit is due to the steam rising from the water in cold weather. This may obscure the men working around it and seriously interfere with the operation of the pit. However, on the whole, it is the most satisfactory from an operating standpoint for the following reasons:

1. It is possible to handle from 4 to 6 engines at once on the ash pit. While this is not confined to a pit of this kind, it is one of the advantages of such a pit.
2. The pit has enough capacity to hold the ashes for a number of days without cleaning, so that if it is not advisable for reasons of switching or cold weather to clean the pit on any particular day, it need not be done.
3. The ashes are cooled, so they may be loaded into cars without damaging them.
4. Fire in the pit is prevented so there is no danger of damage to the pit itself.
5. The operation may be conducted with a minimum number of men.
6. The force may be varied readily to correspond with the number of engines handled.
7. The capacity of the pit may be readily added to by increasing the force or varying the time between cleaning out the pit.
8. The capacity of the pit from a construction standpoint may be increased by adding to the length of the pit.

The Turntable

The turntable is a most important feature of the modern engine terminal. It is required not only to give access to the roundhouse but is also necessary to turn the locomotive and head it in the right direction for its outgoing trip. This is one part of the plant which should, by all means, be duplicated either by another table or by a wye conveniently located to turn the locomotives either as they come into or leave the locomotive terminal. It is also very desirable that one or more

roundhouse tracks be extended through doors in the outer wall of the house to connections with tracks beyond so that some locomotives will not be tied up in the roundhouse on account of a serious derailment or other accident blocking the normal approach to the turntable.

In designing the track layout of the roundhouse and turntable approach provision should be made for as many tracks as possible lining up in such a manner that the turntable tracks form a continuous straight track from the approach to the roundhouse track. Such a layout will tend to reduce the number of derailments and will provide a means whereby any locomotives that are too long or too heavy to be turned can be placed in a roundhouse stall when necessary work has to be done. It should be understood, of course, that the turntable should be long enough, strong enough and well enough equipped to take care of the extreme demands upon it.

In order to dispatch 100 locomotives a day, and providing each dispatchment requires a locomotive in and out over the turntable, 200 moves per day over the table would be required, or at the rate of one every 7.2 min., but with a peak load period of four hours, in which 25 per cent of the movements are made, this would be a movement about every 4.8 min. While many turntables, during certain periods make movement at higher rates of speed, this is about as fast as a table should be used to be entirely dependable.

Turntables should be supplied with double tractors and should be equipped with hand-turning apparatus to be used in case of emergency. It is probably needless to state that the foundations of all weight-bearing parts of the turntable pit and table should be constructed in such a way that failure will be practically impossible. The turntable deck should be constructed of timber so that in case of derailment a renewal of the damaged parts may be quickly made. Engines should not be permitted to go on or off the table unless the locking devices are in place. There is a difference of opinion among operating officers as to the value of derails, but whether they are provided or not, it should be understood that all locomotives should be protected by safety chains whenever they are left standing at a point from which they can drift into the pit, so that in case they are started unintentionally the chains will tend to stop them.

While speaking on the subject of turntables, it should be pointed out that it is essential that adequate drainage of the pit should be provided, including provision for convenient and quick access to the drainage system so that it can easily be maintained free from obstruction and the pit kept dry. Water in a turntable pit with the advent of severe cold weather may bring about a serious condition.

Provide for Repairs

In designing the enginehouse, provision should be made for ultimately handling at least 100 locomotives per day and it is necessary to determine approximately the class of running repairs which will be made and the extent of such repairs. This will involve the study of the capacity of doing such work at other terminals to which the locomotives run, as well as consideration of the most convenient location for the work which should be done as to involve a minimum of unnecessary detention to the locomotives. If the work to be done is such that each locomotive will occupy a stall for an average of 12 hours, it will be necessary to make provision for 50 stalls. If, however, the class of work to be done is such that the average will be eight hours per engine or an average turnover of three locomotives per stall per day, 34 stalls will suffice, while if the average detention can be reduced to six hours, only 25 stalls will be required.

The house itself should be of ample proportions; the stalls being long enough so that the largest locomotive may be brought inside and the doors closed and still have plenty of room to handle material around both ends of the engine. With proper clearance at the doors, sufficient space between

the tracks inside the house will follow as a matter of course.

The materials of construction can be those best adapted to economy in the particular location but the walls should be so constructed that they can be easily replaced should a locomotive run through them. It is desirable that glass be generously used in such construction, principally for the purpose of giving plenty of light but also because it is easily replaced.

The enginehouse is necessarily a dirty place on account of the smoke, which is usually from soft coal. The windows should therefore be such as to afford the best light and to do this it is necessary that they be kept clean. It is useless to place the windows in locations where it is almost impossible to keep them clean and this feature should be given consideration in the design of an enginehouse.

Attention to Details

Enginehouse doors may be of either the swinging or rolling type but in either case they should be of good design and construction so that they can be kept in such condition that they may be closed and opened without undue effort. It is important that the doors of roundhouses be kept closed in the winter time in order to retain the warmth which is essential to the proper operation of the house.

An important feature of the roundhouse construction is the smoke jacks. These should be of a design that will allow the engines to be moved backward and forward a few feet under them so that the work may be done on the locomotive without getting the stacks out from underneath the smoke jacks. Proper smoke jacks improve the conditions in the house and when the working conditions are good, the men do more and better work.

Working conditions in enginehouses, especially in the winter time, are often bad on account of them being filled with steam from engines being blown off, which obscures the vision of the workmen and makes the atmosphere objectionable from a sanitary standpoint. It is essential that the plant be equipped with a modern system for providing hot water for the washing and refilling of boilers and in connection therewith, suitable pipes should be provided for conveying the steam from the locomotives as they are blown off, to the hot well, thus preventing its escaping inside the house. It is a serious matter to stop the work of scores of men in the roundhouse because of lack of proper blow-off lines.

To further improve the atmospheric conditions in the roundhouse, it is suggested that consideration be given to supplementing smoke jacks and blow-off system by exhaust fan of such capacity that the air will be changed at frequent intervals.

This, of course, would require provision for heating the house during the winter. The induced or forced draft from the blowers or exhaust is, in my opinion, an economical way to heat the roundhouse. If the ducts are placed underground, great care should be taken to make them waterproof as it is not infrequent to find air ducts filled with ice-cold water in the winter time, which, of course, chills the air that has been previously heated. Such a plant may be successfully operated if the men who handle it fully understand its requirements.

The steam-blower system of producing draft in locomotives while firing up in the enginehouse is noisy and wasteful of steam. On account of the number of engines being fired up from time to time during the day, it places an unequal burden on the power plant and it may be necessary to carefully limit the number of locomotives on the blower line at one time. A system of induced draft is more economical, less noisy and when coupled with a suitable oil burner for lighting fires, is efficient and rapid.

Cleanliness Important

An efficiently operated enginehouse is kept clean at all times. It costs no more to keep it clean constantly than to

have it dirty most of the time and give it a periodical cleaning. In the design of the enginehouse, care should be taken to eliminate sharp corners, dark niches and other similar places where dirt will collect and are very difficult to be kept clean. Men work better in a clean roundhouse and if, in addition, it is dry and warm, the obtaining of good results is strictly a question of management.

A machine shop should, of course, be provided to take care of the necessary work in connection with running repairs. Its size and equipment will depend upon the amount of repair work which will be made, but it should be such that delays to locomotives undergoing repairs, will be a minimum.

At least 25 per cent of the pits in the enginehouse should be equipped for dropping wheels. In addition, it is very desirable that a locomotive hoist be provided. With such a hoist wheeling and unwheeling of locomotives can be done more quickly and efficiently than with a drop pit. Ample equipment of fixed and movable cranes should be provided for the handling of heavy material. An overhead traveling crane will be found convenient and economical if there is considerable heavy work to be done.

The power house should be of ample capacity to take care of the maximum load during winter and should, of course, be provided with spare units so that there will be no slowing up of any of the work of the terminal due to low steam pressure or other powerhouse inefficiencies.

The supply house should be so located that small supplies may be taken from the incoming locomotives, checked into the house and checked out again to the outgoing engines. This location depends on the general design of the terminal and it should be so convenient as to cause no delay to the arriving and departing locomotives.

The officer in charge of the plant should have an office adjacent to the enginehouse and his immediate staff should have individual offices or desks conveniently situated. The engine crew dispatcher should be provided with a suitable office and the engine crew should report for duty in a space partitioned off for the purpose. A proper arrangement of this kind will enable the crew dispatcher to handle his business in an orderly manner and when a number of crews report for duty during a short period, it will prevent needless confusion. A convenient room should be provided for engine-men registering upon arrival and departure and making out their work reports.

Provide for the Men

Suitable locker rooms for changing their clothes and wash room affording ample supply of both hot and cold water should be provided so that the employees can change their clothing and remove the grime of the day's work and make themselves comfortable. Such facilities tend to increase the efficiency of the force, and in connection therewith an ample supply of sanitary toilets conveniently located, are necessary. Another important sanitary feature is an ample supply of suitable drinking water with sanitary fountains located at frequent intervals in the enginehouse and around the plant. A suitable lunchroom where men may eat in comfort is advantageous.

All of the offices at the roundhouse should be provided with telephonic communication, not only with principal facilities of the locomotive terminal, but also with the yard offices and other offices of a divisional character located in the terminal as a whole. This should usually be handled through a private branch exchange and it is well to supplement such service by interdepartmental telephone lines.

The best possible work is expected of the force in engine terminals and it is therefore necessary, in order that they may perform their work properly, that they be given an ample supply of artificial light. A first class lighting system around the coal dock, ash pit and turntable is essential, for without

it the efficiency of the work would suffer and accidents will occur, causing expense and delay. This lighting system should, of course, be extended to the enginehouse and other buildings of the plant.

It is not unusual to be asked to build a plant to accomplish certain results and then to be allowed only certain funds for the construction. While every advantage should be taken of economies in designing and construction, the operating costs must be given first consideration and above all must be placed convenience of operation. A well designed plant, as a rule, costs no more to build than a poor one.

In conclusion, there are many improperly designed terminals in use today. This is doubtless due to the fact that sufficient care was not taken in their design in the first place and that the ideas of those who were to operate the plant and of those who had had experience in operating such plants were not given enough consideration in making the designs of them.

Many a roundhouse foreman who cannot read plans very well knows what a good engine terminal is and of what a good design of such a terminal consists. It is not unlikely that such a man, when presented with a finely drawn plan on a tracing or blue print would say it was a good plan when he really did not understand fully what it meant. Operating officers sometimes do the same thing both because they do not desire to appear unaccustomed to reading plans and because they have every confidence in the good judgment of the engineering officers whose designs are embodied in the plans. Locomotive terminal engineering requires the services of a man who understands thoroughly what will be done with such a plant after it is completed, and who is able and willing to carefully observe and digest the ideas of those who are skilled in the operation of such plant, to the end that a machine will be produced which will do the work in a most economical and efficient manner. It should be his duty to see that those who are going to operate the plant thoroughly understand the layout, and he should be absolutely certain that they do understand the proposed plant and its operation before their approval is accepted.

Interchangeable Tickets Ordered for May 1

WASHINGTON, D. C.

RULES AND REGULATIONS to govern the issuance and use of interchangeable scrip coupon tickets containing \$90 worth of coupons to be sold at a reduction of 20 per cent, or for \$72, were made public by the Interstate Commerce Commission on March 10 in a supplemental report on its interchangeable mileage ticket investigation, accompanied by a formal order, dated March 6, which requires the use of such tickets on 173 Class I railroads after May 1, instead of March 15, as proposed in the commission's original report. The additional time was allowed because the railroads had shown that it would be impossible for them to print the tickets and put them on sale at ticket offices before May 1.

The rules prescribed include two of the three proposed by the railroads which were objected to by the representatives of the commercial travelers' organizations, requiring photographic as well as autographic identification and providing that the coupons shall not be accepted in payment of excess baggage charges. As to a third rule on which there was a disagreement, the commission ordered the one proposed by the carriers, that the coupons shall be exchanged at ticket offices for one-way or round trip tickets, except when the user boards the train from a closed or non-agency station. It was held unreasonable to require the passenger in such

cases to leave the train and exchange coupons for a ticket at the end of the first conductor's run.

In the commission's original report it held that the books shall be good within a year from the date of sale and on all passenger trains operated by the roads named, except that in case of special or extra fare trains their use shall be subject to the payment of the special or extra fare. The regulations provide for a book containing a photographic signature-witnessed contract and 1,800 coupons of the face value of 5 cents each. They are to be sold at the principal stations, and also, on three days' notice, at minor stations. They will bear a reference to the federal law prescribing a penalty of not to exceed \$1,000 for wilfully offering for sale or for carriage any such ticket contrary to the rules and regulations. When the amount of the fare does not end in 0 or 5 it will be advanced to end in 0 or 5 when it ends in 3 or 4 or 8 or 9, but when it ends in 1 or 2 or 6 or 7 the detachment will be reduced to 0 or 5. Scrip books are not to be honored in exchange for tickets sold at reduced fares, such as suburban, excursion and similar fares. Partially used scrip books will be redeemed by deducting the total face value of the coupons used from the purchase price of the book and refunding the difference, except that if coupons of the face value of \$72 or more have been used the remaining coupons will have no redemption value.

As to the rule that coupons must be exchanged at ticket offices for tickets, the report says: " * * * Respondents' testimony indicates that the duty of collecting ordinary tickets in connection with the routine duty imposed upon each conductor occupies practically all of the time of the conductor not devoted to the safe and proper operation of his train; that the additional burden incident to the calculation of fares and the detachment of scrip will impede the conductor to an extent inconsistent with his responsibility for the safe and proper operation of the train; that it is unreasonable and impracticable to expect conductors to know or to be able to determine the fares to various points throughout the country; that if coupons must be honored on trains loss of revenue will result therefrom, as scrip is equivalent to cash to the line honoring it; that conductors have not adequate facilities to safeguard the scrip; that it would be impossible to prevent the scalping of tickets, and loss of revenue from that source; that their rule that coupons be exchanged at ticket offices is reasonable and that the inconvenience the rule might impose upon passengers in some instances is outweighed by the revenue and practical considerations referred to. Furthermore, a universal book good on practically all railroads throughout the United States is not comparable, in this respect, with the mileage books sold during prior years, which were honored in limited territories. * * *

"Respondents stress the point that if they are required to honor coupons on trains it will be impossible to prevent abuse of the baggage privileges. They refer to the ease with which a person could check his baggage to a given point and then use some other kind of transportation, resulting in the free transportation by the railroads of the baggage. It would be difficult to successfully police the baggage-checking privileges.

"The practical and revenue aspects of the situation appear to us to be of controlling importance and we are convinced that, unless the law compels a different conclusion, respondents' rule should be approved [but] it should be optional with the passenger to leave the train to exchange coupons for a ticket or to remain on the train, in which latter event the succeeding conductor or conductors should honor the coupons. With that exception we find that respondents' rule, that coupons shall be exchanged at ticket offices is reasonable."

Continuing, the report says:

"Among the regulations proposed by respondents are two which provide (a) that where the federal or state governments elect to take advantage of the scrip tickets no further re-

duction will be accorded under the land-grant laws, appropriation acts, or state statutes for the transportation of officers and enlisted men of the United States Army or Navy, or of the state national guard, or other persons identified with the federal or state military establishments; and (b) that scrip books will not be issued in lieu of federal or state transportation requests or other non-negotiable paper. We do not give our assent to these rules, because they present questions which, in our judgment, can be dealt with more effectively by negotiation between the railroads and the appropriate departments of the federal and state governments.

"Under the act as amended we are authorized to make exemptions from its provisions. The findings of our original report are applicable to carriers by rail enumerated in Appendix C thereof. We have since given this question further consideration. We find that the particular circumstances shown justify the exemption of the following carriers: The Bingham & Garfield, the Kansas City, Mexico & Orient, the Lehigh & New England, the Utah Railway, the Nevada Northern, the San Antonio, Uvalde & Gulf, the Ulster & Delaware, the Elgin, Joliet & Eastern, and the Canadian Pacific in Maine."

Commissioners Hall, Daniels and Potter dissented.

Freight Handlers and Common Laborers Get Two Cent Increase

AS NOTED BRIEFLY in the *Railway Age* of March 3, page 531, the following classes of railway employees were granted an increase of two cents an hour under the terms of a decision announced by the Railroad Labor Board on March 1 and effective on the same date: Station, platform, warehouse, transfer, dock, pier, storeroom, stockroom, and team—track freight handlers or truckers and others similarly employed and all common laborers in and around stations, storehouses and warehouses.

The Board, in granting these employees an increase in wages and at the same time declining requested increases for other classes of employees, said:

"The Board feels that only under the most exceptional circumstances would it be necessary or advisable to revise the wage rates of a class of employees before the lapse of one year since such revision had occurred. In the case of common labor represented by the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, the Board in Decision No. 1267 granted an increase of two cents per hour when much less than a year had transpired subsequent to the preceding wage decision, but has not deemed it just and reasonable to award any increase to such classes of skilled employees as have applied therefor during the same period."

Regarding the changes in rules which were also noted in the last week's *Railway Age*, the Board called attention to the overtime and Sunday and holiday rules which were promulgated in its Decision No. 630 and effective February 1, 1922, adding:

"The Board, after observing the operation of this overtime rule for a year and giving the entire question fuller consideration, is of the opinion that the insistence of this class of employees that they should be allowed time and one-half for all time in excess of the basic eight-hour day is a just and reasonable contention. The overtime work of this class of employees is so largely under the control of the carrier that the time-and-one-half rule will not impose any appreciable financial burden.

"The Sunday and holiday rule herein promulgated is similar to that recently handed down in favor of the signalmen. It simply recognizes the justice of the principle that every employee is entitled to one day off duty in seven. In practice, that day will and should ordinarily be Sunday, but work necessary to the continuous operation of the carrier in its service to the public may be done on

Sunday without the payment of punitive overtime, by the carrier's assignment of some other day of rest to those engaged in such indispensable Sunday work. In such instances as an employee is required to work on his regularly assigned day off duty he will receive time and one-half. This rule is designed to guarantee to the employee so far as possible one day of rest in seven without undue expense or inconvenience to the carrier. It recognizes the rights and necessities of the carrier, the employee and the public."

Another long dissenting opinion was filed by A.-O. Wharton, member of the labor group on the Board, who took exception to the majority opinion because it did not restore the rates of pay established by Decision No. 2. Mr. Wharton gave as his reason for his dissent, the following:

"1. Even with the increase asked for, the wage requested would fall below the minimum living wage level established by the budget of the United States Bureau of Labor Statistics or any other budget sponsored by an authoritative agency.

"2. Real wages in the railroad industry should be increased materially over the level set by General Order No. 27.

"3. The cost of living has been increasing during the past few months and further increases are certain to follow as a result of the upward trend of wholesale prices.

"4. Wages of railroad employees should be higher than wages for similar work in outside industries because of the hazards of the employment, the degree of responsibility, and other conditions governing railway workers."

Mr. Wharton again went into great detail regarding the budgetary method of determining a just and reasonable wage and more briefly into the other reasons assigned for his dissent, the entire trend of his argument being that the employees were entitled to substantial increases at this time not only because of the change in current conditions but because of the alleged injustices of earlier periods.

A short dissenting opinion was also appended to the decision by Samuel Higgins, J. H. Elliott and Horace Baker, the three members of the railroad group on the Board. They contended that:

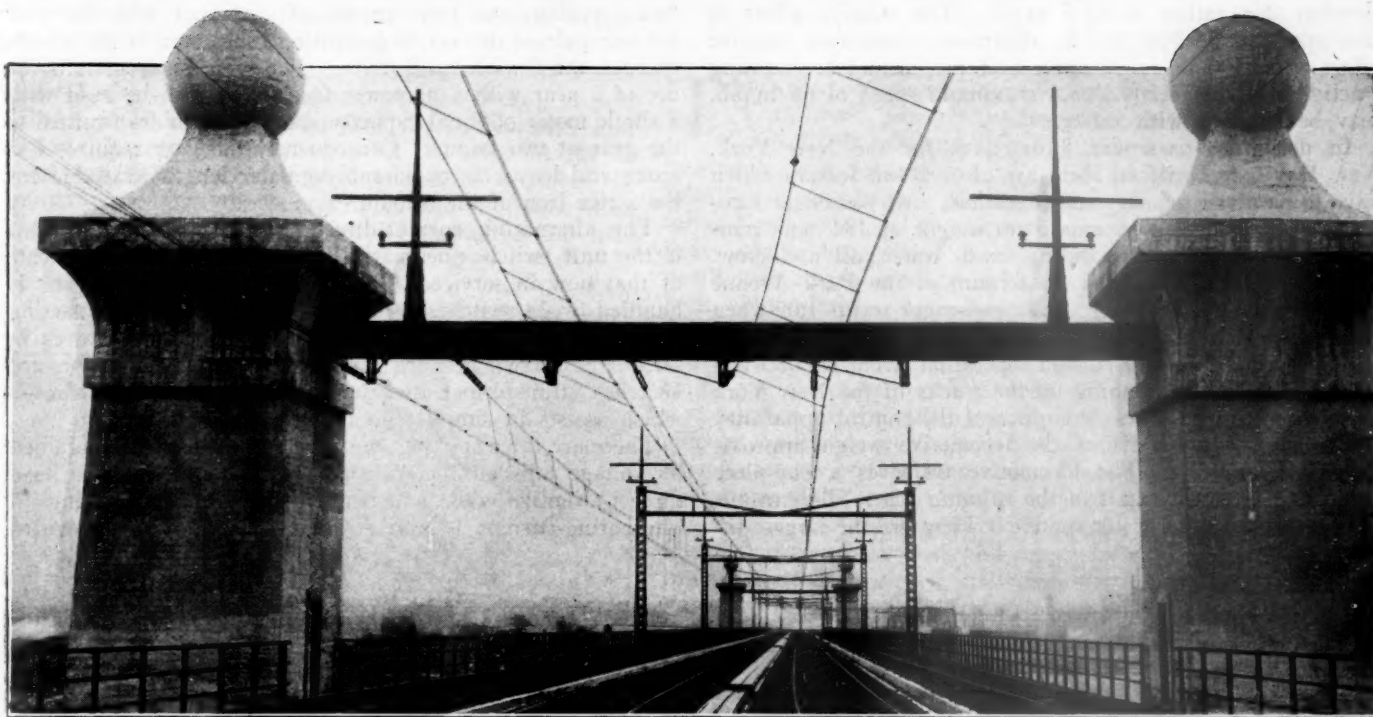
"In our judgment there has been no change since Decisions Nos. 630 and 1074 were made effective, neither does the evidence submitted reveal any conditions that justify increases in rates of pay or changes in rules.

"The principal reason for changing the rule seems to have been based on the belief that unless some penalty was imposed on the carriers for overtime worked that the carriers would work the men an excessive number of hours. During the past year no complaints of that nature have reached the Railroad Labor Board, nor do the statistics gathered by the Board reflect any such condition.

"If the principle upon which the rule for overtime payment was based in Decision No. 630 was correct then, it is correct today; therefore, no change in this rule should have been made, and it is well to state that such a change was requested by employees on but twelve carriers.

"It may reasonably be assumed that the majority of the Railroad Labor Board in framing Decision No. 630, from which the undersigned dissented, exercised the same painstaking analysis of data as was exercised in reaching conclusions embodied in Decision No. 1621, and, if the assumption be true, it is incomprehensible how the latter conclusions were reached unless it be from the sentimental desire to exercise greater liberality with the carriers' revenues on the fallacious theory that overtime for the classes embraced was entirely within the control of the carrier and in any event would not prove an appreciable financial burden."

A MANDAMUS WRIT compelling the New York, Chicago & St. Louis to open its books for the inspection of a stockholder was granted in the court of common pleas at Cleveland, Ohio, on March 2. The stockholder, owner of 3,000 shares, claimed the right to obtain names of other stockholders to whom he wished to make protest against certain plans which the railway officers contemplated putting into effect. Counsel for the railroad protested on the ground that complainant held the shares for speculation.



Southern End of Little Hell Gate Bridge on the New York Connecting Railroad

All-Electric Passenger Service for New Haven

Twelve New Electric Locomotives Will Eliminate Steam Passenger Locomotives on Electrified Section

By W. J. Clardy

General Engineering Department, Westinghouse Electric and Manufacturing Company

THE NEW YORK, NEW HAVEN & HARTFORD electrification embodies all classes of service on a trunk line railroad. The main line between New York and New Haven, Conn., a distance of 72 miles, is an example of what can be done by electrification on a congested four-track section with extremely heavy freight and passenger traffic. There are nearly 600 miles of electrified track, including some of the busiest main line and yard trackage in the world. Yards at Oakpoint, N. Y., and Westchester, N. Y., are served entirely by electric switcher locomotives.

The present electric motive power consists of 106 Baldwin-Westinghouse locomotives, 52 for passenger, 38 for freight, 16 for switcher service, and 35 Westinghouse equipped multiple-unit motor cars. The first 41 passenger locomotives, placed in service in 1906 and 1908, are the 2-6-2 type and weigh 102 tons complete. The last five passenger locomotives were built in 1919 and are the 2-6-2+2-6-2 type, weighing 180 tons complete. Sixteen 80-ton, 0-8-0 type switcher locomotives were placed in service in 1912, and 36 110-ton, 2-8-2 type road freight locomotives in 1912 and 1913. The first of the 35 multiple-unit motor cars were operated in 1909 and the last eight cars went in service in 1922. These cars range in weight from 84 to 91 tons complete with all equipment and without passengers. Each motor car is capable of hauling two trailer cars.

In 1916 and 1917 a complete study was made of the traffic requirements to determine what type of motive power was best adapted for the service. The original types of freight and switcher locomotives were considered suitable for handling the continued increase in this class of traffic. The

first passenger locomotives which were built were satisfactory, except as to capacity. They had been in service only a few years when the railroad began to replace the light 40-ton wooden coaches with steel cars of 62.5 tons weight, having only about 15 per cent greater seating capacity for 58 per cent greater car weight. At the present time these locomotives have to be double-headed 80 to 90 per cent of the time, and even at that do not have capacity to handle many of the heavier trains. With so many heavy trains in operation it is desirable to have a locomotive that can handle them without double-heading. For these reasons a new locomotive of the 2-6-2+2-6-2 type was designed, which is capable of handling all of the heavy passenger trains. Five of these locomotives were placed in service in 1919.

New Locomotives Under Construction

Recently 12 new 180-ton Baldwin-Westinghouse passenger locomotives were ordered and are now being built. These will be identical to the five passenger engines placed in service in 1919, except for some refinements in minor details. These locomotives are the 2-6-2+2-6-2 type equipped with six twin motors and will operate from a 11,000-volt, single-phase trolley or a 650-volt, direct-current third rail. The gear ratio will be 25 to 89 on 63-in. drivers and each locomotive will have two pantographs and four third-rail shoes for current collection. The weight complete will be 180 tons with 122 tons on drivers.

The motors have a combined rating of 2,016 h.p. and will develop a tractive effort of 23,200 lb. at 32.6 m.p.h. The continuous rating is 15,800 lb. tractive effort at 39.4 m.p.h.

The locomotives have a high speed rating of 2,424 h.p. and develop this rating at 45.5 m.p.h. The tractive effort at this speed is 19,900 lb. A maximum momentary tractive effort of 52,500 lb. is available and the normal accelerating tractive effort is 36,200 lb. A maximum speed of 66 m.p.h. may be attained with safety.

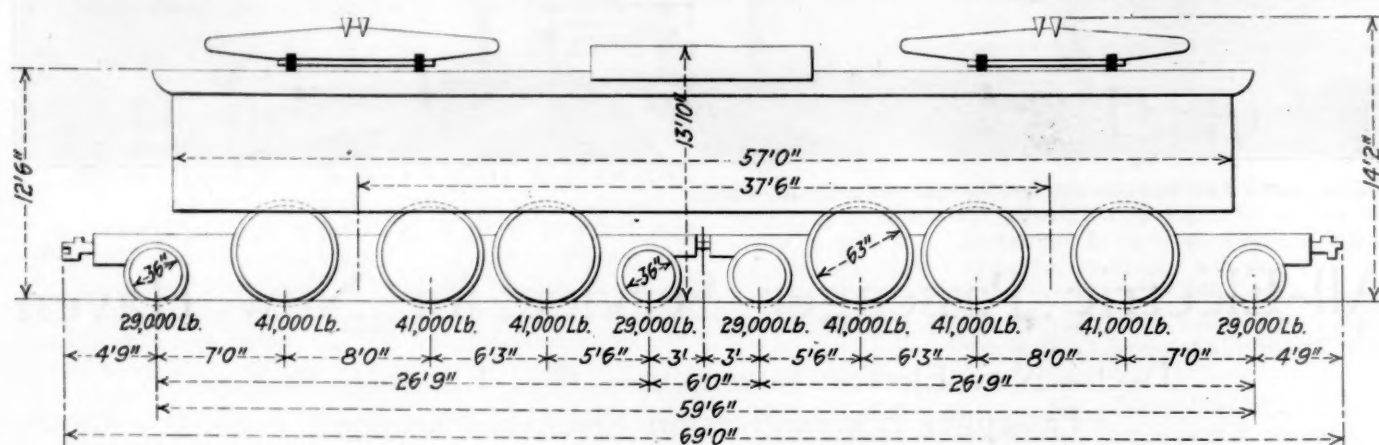
In designing passenger locomotives for the New York, New Haven & Hartford there are always two factors which have to be given primary consideration. All passenger locomotives are limited to a maximum weight of 181 tons complete with all details including sand, water, oil and crew. This restriction is imposed on account of the Park Avenue viaduct in New York over which passenger trains run when entering the Grand Central station. The locomotives must be designed for direct-current operation from a 650-volt third-rail to permit running on the tracks of the New York Central. This, of course, complicates the control apparatus.

The mechanical parts of the locomotive weigh approximately 175,000 lb. The locomotive frame is a one-piece steel casting for each half of the running gear. This means two frame castings per locomotive. They are the largest in-

mutator lids, and gear cases. Each motor armature shaft has a pinion, and two pinions are in mesh with the gear for one pair of drivers, transmitting the power to the wheels through the flexible quill drive. The twin motor permits the use of a gear with a narrower face than could be used with a single motor of equal capacity since power is transmitted to the gear at two points. Consequently the gear requires less space and leaves a considerably greater length available for the active iron of the armature.

The alternating current-direct current control equipment is the unit switch, pneumatically-operated type; a duplicate of that now in service. The entire control of an engine is handled by 28 switches. This is accomplished by connecting the motors in four permanent groups of three armatures in series. The switches are arranged in three groups—motor switches, transformer switches, and resistance switches—which assists in simplifying the control.

There are three starting and nine running notches obtained by voltage taps on the transformer. The locomotives have three preventive coils, which are used when accelerating on alternating-current. Nine frames of grids are provided



Side Elevation of One of the New Locomotives, Showing Wheel Spacing and Loading

tegral castings ever made for a locomotive and each casting weighs 18,000 lb.

The quill drive and details for the new locomotives are the same as on those now in service. The drive is of the twin motor type and consists essentially of a single gear meshing with two pinions, one on each armature shaft. The frame of the motor includes two integral bearings carrying a hollow shaft or quill, which surrounds the driving axle. Sufficient clearance exists between the axle and the quill to permit the axle to accommodate itself freely to track irregularities. At the end of the quill, a gear is mounted, meshing with the motor pinions. At each end of the quill are bolted six castings, each gripping one end of a helical spring located between the wheel spokes. The other end of each spring is gripped in a casting which is bolted to the driving wheel.

The twin motor will develop 336 h.p. at 275-volts for one hour and 276 h.p. continuously at the same voltage. The speeds at these ratings with 25: 89 gear ratio and 63-in. drivers are 32.6 m.p.h. and 39.4 m.p.h., respectively. A maximum of 357 volts may be applied to each motor armature when the trolley potential is 11,000 and the locomotive is operating on the highest speed notch of the controller. The motors are the series commutator type with a resistance lead winding in the armature, and have compensating windings.

The twin motor really consists of two complete motors with a common frame, thus making a permanent double unit. This permits an efficient utilization of the limited space available for motors and gearing and gives a more balanced design. A twin motor weighs approximately 13,000 lb., including bases, axle caps, axle bearings, dust guards, com-

mutator lids, and gear cases. Each motor armature shaft has a pinion, and two pinions are in mesh with the gear for one pair of drivers, transmitting the power to the wheels through the flexible quill drive. The twin motor permits the use of a gear with a narrower face than could be used with a single motor of equal capacity since power is transmitted to the gear at two points. Consequently the gear requires less space and leaves a considerably greater length available for the active iron of the armature.

Series-parallel control is not provided for direct-current operation as sufficient speed can be obtained when three motors are connected in series. Series-parallel operation would complicate the control and the gain in efficiency is negligible. A field shunt, which is effective on the last controller notch gives the speed that is necessary in the direct current zone.

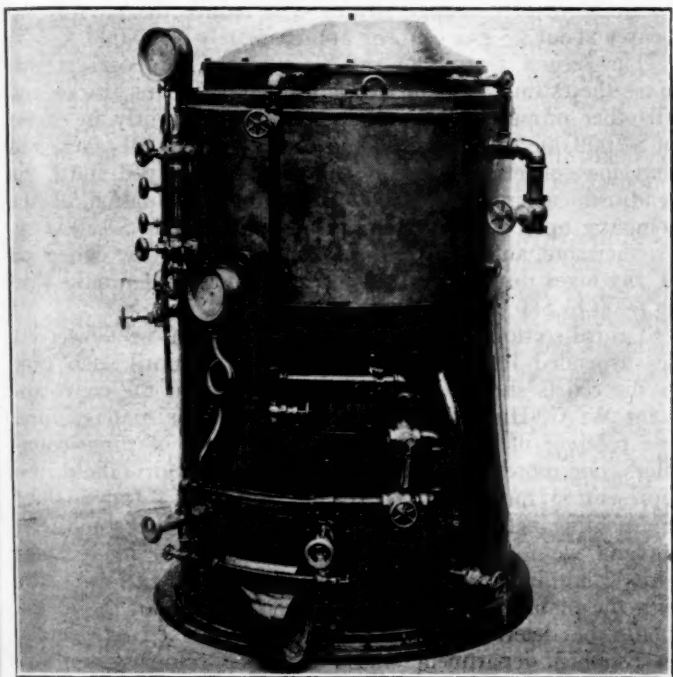
The airblast transformer weighs 15,300 lb. and is rated at 2,100 kilovolt-amperes. It has the necessary low tension taps for accelerating the locomotive and supplying power to the auxiliary apparatus. The storage batteries provide energy for operating the control switches and a motor-generator set charges the batteries. Motor-driven blowers are supplied to ventilate the transformer and main motors. There are two air compressors included with the air brake equipment, each having a 60 cu. ft. displacement. The blower and compressor motors are identical.

An important feature of the locomotive is the train heating equipment. Each locomotive is equipped with oil-fired flash boilers and the necessary oil and water tanks. The boiler has sufficient capacity to heat a 12-car train.

The 180-ton locomotive was selected for service on the New York, New Haven & Hartford as the best size of unit to meet all of the operating requirements. It is desired to handle all of the heavy passenger trains with a single engine, and the 180-ton locomotive has the capacity for this work.

The heaviest of the express trains consist of 12 pullman cars of 75 tons each making 900 tons trailing load. The 180-ton locomotive is capable of hauling a train of this weight between Grand Central station and New Haven in 99 minutes on a non-stop run, which includes numerous necessary slow-downs. This is a schedule speed of over 44 m.p.h. With stops at 125th street, Stamford, South Norwalk and Bridgeport, the run can be made with the same weight of train between Grand Central station and New Haven in 115 minutes provided the aggregate of the stop time does not exceed 7 minutes. In local service, trains of 460 tons trailing load can be handled.

The new locomotives will also be operated over the New York Connecting Railroad and Hell Gate bridge into Penn-



Oil-Fired Flash Boiler for Train Heating

sylvania station. They are capable of hauling a 900-ton train from New Haven to Pennsylvania station in 110 minutes on a non-stop run. On one section of the west-bound Hell Gate bridge approach the grade averages 1.16 per cent for 2 miles, with a maximum of 1.22 per cent. The heaviest demand is placed on a locomotive when it is ascending the west-bound approach on this bridge.

Twelve new locomotives are being purchased at the present time, as this number is required to provide 100 per cent electric passenger service. There has not been sufficient electric motive power to accommodate all of the passenger trains, and a number of them have not been operated with steam power, particularly those routed over Hell Gate bridge. Operating officials desire to handle all of the passenger trains with electric power to secure more efficient and reliable service as well as to keep the steam equipment out of the electric zone. After the 12 new locomotives are placed in service all passenger trains will be hauled by electric locomotives, both on the main line and on the New York Connecting.

The five 180-ton passenger locomotives that have been in service the past four years frequently make over 500 miles per day in which the longest single trip that is made is 72 miles, the distance from New York to New Haven, Conn.

A number of the 41 original locomotives of the 2-8-2 gearless type have now made over 1,000,000 locomotive miles and the others are very close to this figure. They have been in service for about 16 years.

C., P. & St. L. on Verge of Abandonment

THE ABANDONMENT of the Chicago, Peoria & St. Louis, a railroad property representing an investment of over \$8,000,000 and operating more than 225 miles of lines with gross earnings in excess of \$2,000,000 annually, is asked in a petition now pending before the Interstate Commerce Commission. The proposal is made by the first mortgage bondholders who fear that continued operation will result in a steady increase in the deficit which has already been accumulated. At a hearing on the petition held at Springfield, Ill., on February 6, increased operating costs, a steady decrease in the volume of freight and passenger traffic and a greatly impaired credit which has prevented the maintenance of the rolling stock and right-of-way in an efficient condition, were given by officers of the road as the reasons for its present condition. The proposal to abandon operation, which would deprive a large area of central Illinois of adequate transportation, is being vigorously protested by the patrons of the road, and several proposals for the continuation of train service are being considered by the commission with the petition for abandonment.

The Chicago, Peoria & St. Louis operates a single track road from Peoria, Ill., through Pekin, Havana, Springfield, Jerseyville and Alton, to East St. Louis, a distance of approximately 200 miles. It operates also a branch line 25 miles long from Jacksonville, Ill., to a junction with the main line at Havana. The district which is served is a prosperous agricultural and mining section which provides a good volume of local traffic. The road is fortunately situated as to terminals, having an interest in the Peoria & Pekin Union at its northern end and owning its own tracks to the end of the Eads bridge at East St. Louis. Its operating costs, however, are high on account of the heavy grades and low standards of maintenance of the line.



The C. P. & St. L.

The Chicago, Peoria & St. Louis began to operate a line running south from Springfield in 1887, patrons in the territory served by this first line having subscribed \$100,000 for its construction. The northern portion of the present line was secured in the same year through the purchase of the Peoria, Pekin & Jacksonville, the Springfield & Northwestern and a quarter interest in the Peoria & Pekin Union. The southern extension to East St. Louis was completed in 1890, bringing the

total mileage of line in operation to a length of over 200 miles.

The first 11 years of operation of the line, which was then primarily a freight carrier, were successful, with the single exception of the panic year of 1893. By 1895, the net earnings had risen to \$51,634 and during subsequent years a surplus was accumulated which amounted to \$260,712 on December 31, 1904. During subsequent years the C. P. & St. L., was less successful and on June 1, 1914, it defaulted in the payment of the interest on its general and refunding

mortgage bonds. The mortgage was then foreclosed and receivers appointed. This receivership has continued up to the present time.

For several years prior to the period of federal control the road served as an intermediate carrier between the lines north of Peoria and those south and west of St. Louis and handled a considerable volume of interchange freight traffic from connecting lines, and in 1916 and 1917 its net earnings were \$99,378 and \$73,243, respectively. During federal control, this interchange traffic was diverted over the Chicago & Alton and other lines with lower grades which practically eliminated all freight traffic on the road other than that local to it. Following the return of the railroads to their owners the road was unable to recover this interchange traffic which it had formerly handled, and its traffic remained at the low ebb, of the period of federal control. Passenger traffic which was also formerly of a profitable volume, has virtually disappeared during recent years on account of the widespread use of motor cars for short distance travel. Thus the company's revenues are limited almost entirely to its local freight.

At the Interstate Commerce Commission's hearing on the application for permission to abandon the line, testimony was introduced to the effect that the current liabilities of the road are \$1,067,781.26 and its present cash assets only \$523,336.67. During the 2½ years following federal control the average deficit, before payment of bond interest or interest on receiver's certificates, aggregated \$832,000 per annum. Taxes for the past two years, which were based on the original assessed value of the properties of \$7,500,000 and which amount to \$228,000, are also unpaid. Attempts by county tax collectors to collect their assessments through the sale of various portions of the railroad's property has been prevented only by court order. The operation of the railroad has been continued to this time only by the omission of the proper expenditures for the maintenance of roadway and equipment so that the physical properties are now in a deteriorated condition.

It is estimated by officers of the road that \$2,823,000 will be necessary immediately in order to restore the railroad to a normal condition. Of this sum, \$750,000 is required to pay current liabilities and provide working capital, \$1,725,000 to make immediate repairs on roadway and equipment in order to insure safety of operation, \$118,000 to pay off the equipment trust certificates and \$230,000 to cover the receiver's certificates. The total liabilities were given at the hearing as approximately \$9,000,000, including \$4,000,000 capital stock, \$4,000,000 first and second mortgage bonds and \$1,000,000 current obligations, receiver's certificates, etc. The estimated scrap value of the line at this time is \$2,750,000.

Plans for Continued Operation

Citizens and manufacturing concerns along the line of the road have united in an effort to insure the continuance of its operation. Steps have been taken among these interests to secure financial aid and these have been successful to some extent. Abandonment of the line would deprive a considerable section of agricultural territory of transportation. The Illinois Manufacturer's Association has proposed that certain sections of the line be abandoned and others maintained in operation. According to this plan, 20 miles of track in each direction from Springfield would be maintained as well as an eight-mile section from Pekin to Manito, and the portion of the line from Grafton through Alton to East St. Louis, a distance of 35 miles. It is claimed that these sections could be operated without loss, if necessary, by the patrons themselves. Through the efforts of this association, the Illinois Senate passed a resolution two weeks ago protesting to the Interstate Commerce Commission against the abandonment of the line.

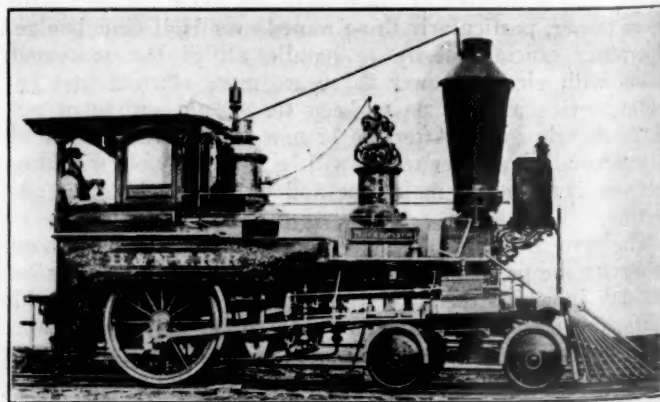
Another plan proposed for the reorganization of the com-

pany and its continued operation as a freight carrier was advanced by J. B. Searcy, assistant attorney general of Illinois, and was presented to the commission at the hearing as a "last resort" proposal. The most radical change in operation proposed in the plan is that all passenger trains be annulled and that such passengers as may wish to be carried be accommodated on freight trains or in passenger coaches attached to freight trains, it being claimed that this measure would eliminate at least three-fourths of the loss occasioned by the running of passenger trains, and effect an estimated saving of \$70,000. It is also proposed that stations where the business secured does not pay the expense of their operation be closed. It is claimed that this measure and the discontinuance of passenger trains will reduce the payroll expenses about 25 per cent, or approximately \$330,000.

The second feature of the "last resort" proposal is that since the estimated value of the locomotives, cars, tracks and all other property of the company is only slightly in excess of \$2,000,000, this value should be the basis of all taxes, and that the collection of taxes should be restrained until the readjustment in valuation is made. The valuation of the company upon which taxes are now assessed is \$7,500,000. Furthermore, an injunction is asked restraining the collection of any taxes during insolvency, which, it is said, would save \$60,000 to \$80,000 per year.

A third section of the proposal is that the present receivers be suspended for a period of one year, or until such time as the courts should order otherwise and that the court appoint W. C. Hurst, now general manager, as manager and sole receiver of the company. A committee of three councilors, one representing the patrons south of Springfield, one representing the patrons north of Springfield and a third representing patrons on the branch line from Jacksonville to Havana, would act as advisors to the manager. These councilors would be approved by the court and be in full sympathy with the plans of readjustment until the result of the efforts should be determined. It is said that this change in the receivership department would save the company approximately \$30,000 each year, through the cessation in payment of the receivers' salaries.

The last proposal is that during the period of suspension of the present receivers, the collection of all past obligations made by these receivers including taxes, should be stayed until further order of the court. Advocates of the plan claim that the adoption of the proposal would result in the reduction of annual expenses by \$490,000. Since the average annual deficit of the five-year period from 1916 to 1921 was \$238,387, the proposed saving would produce an annual profit of substantially \$51,000 on the basis estimated by the patrons' committee.



Courtesy, Railway & Locomotive Historical Society

Hackensack & New York Railroad, 1860

This road is now a part of the New Jersey & New York, operated by the Erie. Locomotive built by Rogers Locomotive Works, Paterson, N. J.

The Issue of Radicalism Versus Government*

Describing the Campaign Now Being Conducted Against the Courts by Various Railway Labor Leaders

By Ben W. Hooper

Chairman, United States Railroad Labor Board

THERE IS GENUINE CAUSE for uneasiness in the fact that a large and influential element of people in this country are headed toward socialistic radicalism, without being aware of it. A very positive movement is on foot to throw the forces of organized labor into politics as allies of socialism. This development is not surprising, in view of the fact that it is merely a duplication of what has already occurred in various countries of Europe. For the time being, the leaders of this movement do not call themselves socialists, but the socialistic trend of their activities is quite obvious.

Until recently, organized labor has largely confined its operations to conducting along economic lines the struggle with capital for a larger share in the product of its hands and for improved working conditions. Only occasionally and locally has labor attempted to make itself felt in politics in an organized way, and then, as a rule, without any definite, distinctive policy.

The new political movement of organized labor is headed and controlled by certain leaders of railway labor organizations, who have formed a working agreement with the socialist party and other radical groups.

The majority of the railroad labor organizations are affiliated with the American Federation of Labor. The leaders of a few of these organizations have so far held aloof from this movement, but most of them are represented in it. The railway employees alone, numbering as they do approximately 2,000,000, if they could be delivered *en bloc* at the polls, would constitute a formidable vote. The socialists polled a vote of 919,799 in the national election of 1920, and it is not thought that any considerable percentage of this vote came from railway employees, but some of the other labor groups represented in this new political bloc, for example, the miners and garment workers, doubtless contributed a large portion of it.

The financial resources of these labor organizations are actually great and potentially enormous. As an illustration of the big scale upon which they conduct their affairs, one of the railway unions expended in the holding of its national convention in 1922 upwards of \$350,000, and it is not exceptional for the conventions of the larger railway organizations to cost a sum running well into six figures.

One of the organizations owns a bank capitalized at a million dollars, has recently purchased valuable coal lands, and pays its chief a salary of \$25,000 per annum. Several of them own pretentious buildings in which they maintain elaborate headquarters, well manned with generously paid employees, and have assets running into the millions.

Each of the organizations publishes its own magazine, and the railway unions jointly publish a weekly paper in Washington that is purely political and that nearly all of the organizations send to their entire membership at the expense of their treasury funds.

None of these matters are mentioned by way of criticism, but merely for the purpose of exemplifying the power and resources of these organizations and for the further purpose of pointing the moral that they are not posing as economic

underdogs and "wage-slaves" of the present industrial system.

The organizations of railway employees, as a whole, were immensely advanced and strengthened during federal control of the railroads. They have suffered less from deflation since the war than any other class of labor.

Strange That Leaders Should

Form Alliance With Socialism

It may therefore seem strange that the leaders of several of the highest paid classes of railway employees should form an open alliance with socialism and undertake to lead their constituents into such a movement. It often happens that a labor leader excuses a questionable action by saying that he was impelled to it by the membership back of him. So far as discernible, there is no great amount of spontaneous sentiment among railway employees for socialism or any of the other political "isms" that have been plucked from Europe and transplanted in America.

Of course, it must be said that this new political movement fostered by leaders of organized labor does not propose immediate entrance into the socialist party, but merely co-operation with it. The socialists wisely welcome this as a first step and naturally expect it to be followed by another in the same direction. They consider the movement unquestionably socialistic in some appreciable degree or they would not co-operate with it.

The outstanding feature of the program of these particular railroad labor leaders which appeals to the socialists is their advocacy of government ownership of the railroads under the so-called Plumb plan. While it is recognized that there are people who favor government ownership of the railroads who are not socialists, it is perceived by the socialists that government ownership of public utilities is the first long stride toward the socialization of all industries. It must be noted, however, that the heads of some of the railroad labor organizations have not subscribed to the Plumb plan, and the idea that government ownership would be advantageous to the employees is gravely doubted.

The leaders of a large majority of their organizations have launched an aggressive campaign for government ownership, and they are utilizing their official magazines for spreading propaganda to this end. A typical utterance on this subject is embraced in the following excerpt from a recent issue of *The Journal of the Brotherhood of Locomotive Engineers*, where it was printed in display type:

Let us face the railroad problem honestly. We shall continue to have freight tie-ups, labor trouble, inefficient service, overvaluation, and inside contract scandals, so long as the railroads of this country are operated for private profit and not primarily for public service. The railroads, like the dirt roads, must belong to the people. The workers themselves possess the technical brains, devotion to duty, and loyalty to the public weal, requisite for the efficient operation of the railways. Give them a chance. The Plumb plan shows the way. Must the railway employees and the people of the United States suffer another railroad strike, perhaps far more serious than the last one, to impress this truth upon them? The Plumb plan is our only hope. Either that or chaos.

Government ownership of railways, however, is not ex-

*Part of an article appearing in the *North American Review* for March, 1923. Copyright, 1923, by North American Review Corporation. Reproduced by permission.

pected to be achieved at any early date by discussion and agitation, based on present conditions. Certain intermediate developments must be brought about, which will so discourage and disgust the public with private ownership and operation as to incite a popular clamor for government ownership. The above quotation from the Engineers' Journal furnishes the key to the situation: first a taste of chaos, and then the joyful acceptance of government ownership.

The people of this country are afraid of government ownership of railroads, with its infinite possibilities of political log-rolling and graft, bureaucratic inefficiency, class domination, and increased taxation. The only consideration that will ever impel them to give ear to this proposition will be complete and conclusive evidence that private ownership and operation have absolutely failed to meet the needs of the American public. They will then fly from the ills they have to others that they know not of.

In the meantime, this alleged progressive movement is driving directly toward one point, and that is, in general terms, to remove from the statute books of the United States and from the federal constitution every vestige of law and legal machinery that is designed to restrain strikers from the use of physical force and to regulate their use of economic power in the enforcement of their demands against employers and the public. With this purpose fairly well accomplished, our government would become one of force rather than law, and chaos would indeed reign. Without attempting to file a full bill of particulars in connection with the foregoing radical program, euphemistically called progressive by its proponents, let a few examples suffice.

In the first place, it is seriously proposed to change the form of our government by undermining and overthrowing the independence of the judiciary department. The proposal to empower Congress to set aside a decision of the Supreme Court which declares an act of Congress unconstitutional is revolutionary in its nature.

As a corollary to this proposition, the demand is made that the courts should be deprived of the injunctive powers exercised in connection with strikes, or that those powers should be greatly limited. Any man who will look this demand squarely in the eyes knows that it has but one meaning. It means that the labor leaders who espouse it desire that strikers and their coadjutors shall possess the unfettered license to destroy property and to intimidate and assault those who exercise the right to do the work that the strikers have abandoned. It means that the courts of our land must stand shackled and gagged in the presence of insolent and triumphant force. It means that the strongest safeguard of life, liberty and property known to our republic must be broken down in order that the onrush of the frenzied mob may not be obstructed.

The injunctive power is not an instrument of oppression. Not often has it been perverted from its proper use. In tens of thousands of instances it has protected the weak against the mighty, the law-abiding against the lawless, the peaceable against the violent. Nothing is to be gained by mincing words in the discussion of this question. The people of this country know that the economic power of the strike degenerates nine times out of ten into crude, raw, naked, hideous physical force. Because this is true almost without exception in big strikes, it must be anticipated by those who order strikes. Indeed, it is known that only in rare instances can a strike succeed without the accompaniment of violence.

All the Phases of Civil Warfare

The recent railroad strike manifested practically all the phases of civil warfare. The new workers were besieged inside their stockades. The blockade of shipments of all sorts of commodities was attempted. Bombs were thrown for the destruction of men and property. Murders and assaults

were committed. Then, when the attorney-general, after infinite patience and the careful gathering of evidence, resorted to the courts for the defense of the lives of workers and the preservation of the public utility upon which the people at large must depend for food and fuel, there arose a demagogical outcry against the courts, the Department of Justice and the power of injunction.

This, however, is not an isolated political phenomenon. It is only one incident in the steady campaign of vituperation and abuse that is being promiscuously waged against the courts of the land in support of the definite program above mentioned. By far the most alarming feature of radicalism in this country today is the persistent, systematic, widespread effort to destroy the confidence of the people in the courts. The extent to which this is being carried on can be realized only by those who read the radical publications.

The War on the Courts

A few quotations taken at random, from a small number of publications, illustrate the war that is being made on the courts, the state militia, the police and other agencies of law and order by leaders of even conservative organizations. One or two of these excerpts also express the prevailing sentiment in regard to the man who takes up the work laid down by a striker, namely, that the strike breaker or "scab" has no right to do such work, that violence against him is perfectly justifiable, and that the ideal public official is the one who declines to interfere when the strike breaker is beaten up and compelled to flee from his work, or is perhaps murdered. The statement that "strike breaking is becoming unhealthy in Illinois" is a delicate and feeling recognition of the fine work done in the massacre of twenty-odd strike breakers at Herrin.

The quotations follow:

Locomotive Engineers' Journal, July, 1922:

Putting the gown of a Chief Justice on a man does not alter by one whit the respect to which he is entitled. Why should the workers accept as divine law the decrees of the same "Injunction Bill" Taft, who, first among federal judges, nailed the engineer to his locomotive and denied him the right to quit work when the job and pay dissatisfied him? * * *

Perhaps Mr. Debs is right when he says in his article in this issue of the Journal that Mr. Taft was appointed to administer this kind of justice.

Locomotive Engineers' Journal, June, 1922:

We sound a warning to the courts, the police and other agencies of "justice" which are using force and the power of the state to coerce organized labor. They are treading upon dangerous ground. They are doing more to overthrow law and order and destroy the government than all the bolsheviks and radical agitators who ever existed, and they are compelling even the dullest worker to realize that the right of labor will receive scant consideration until the state itself is controlled by the producing classes.

* * * * *

We shall not rest content until the unwarranted judicial veto is taken from the Supreme Court and the expressed will of the people becomes the unquestioned law of the land.

* * * * *

Must democracy be defeated by the New Slavery, which is destroying the Old Freedom? What hope can we put in political action, in economic organization, in the struggle for a free press? Is there any remedy short of revolution? These and other vital social issues Dr. Howe analyzes in "Revolution and Democracy."

Journal of Electrical Workers and Operators, July, 1922:

Chief Justice Taft of the United States Supreme Court, is to be given credit for removing all doubt about the courts, in the main, being the apparatus of the big interests, barren of justice, and club of those who have looted America.

Amalgamated Sheet Metal Workers' Journal, April, 1922:

America today is a composite of every form of tyranny practiced in the Old World and historically recorded, until the New World can give the extinct and existing monarchical forms of

government in the Old World lessons in how to effectively fit the necks of a subject people to the galling yoke, not of freedom but of an unacknowledged but nevertheless existing vassalage.

Amalgamated Sheet Metal Workers' Journal, July, 1922:

A Union Army officered by Union Men would logically be in perfect harmony with trades union ideals, for only by and through such an agency would the present practice of recourse to armed intervention in labor disputes cease to be the crowning infamy of an alleged democratic republic.

The Railroad Telegrapher, August, 1922:

No man can deny the fact that, as a result of recent decisions of the Supreme Court, the people suffer while the few rejoice, and the people will continue to suffer until such time as law is made supreme and the government of five men now afflicting the country is done away with. There is no law now—there exists but anarchy—the anarchy of a government based on the whims, susceptibilities, wishes and desires of five old men who are opposed to the law made by the people for the people.

The Railway Conductor, May 1922:

A judicial noose that strangles labor is used by coal owners to conceal their profits and gouge the public.

This situation shows how far property-biased courts can go without protest from the public whose attention is drawn from these things by master propagandists.

Machinists' Monthly Journal, August, 1922; Department "Women's Sphere":

The absurd part of it is the taxpayers in every State are really paying for the establishment and maintenance of these state militia and constabularies that are only used to protect the property and financial interests of the wealthy class. Did you ever know of them being used for any other purpose? Most assuredly not for the benefit of the worker.

Texas Railway Journal, August, 1922:

The Chicago and Alton Ry. sent in a bunch of strike breakers on Slater, Mo. The women of the city congregated and drove them out of the city. The mayor and sheriff are both order men and refused to interfere with the women. Strike breaking is becoming unhealthy in Missouri and Illinois, as it will be elsewhere when real union voters exercise enough intelligence to vote their labor tickets straight, leaving the "labor skate" element and disruptionists to mingle with their kind—the strike breaker.

If you, a worker, persist in your disregard for the necessity of discipline and solidarity at the ballot-box, then you will later be compelled to resort to physical force—to the rifle, if you please—to compel from the masters recognition of your rights, and remember you have no rights you cannot defend.

Such excerpts might be extended ad infinitum, but those given are typical of the sentiments that are being inculcated among laboring men with reference to the government under which they live. As a rule, these come from the leaders of the most highly paid workers in the country, the purchasing power of whose wage is considerably higher than it was before the war, notwithstanding the increased cost of living. The tone and tenor of the utterances of the really radical papers and leaders can well be imagined without being set out here.

This indiscriminate attack on the courts is equivalent to an attack on all forms of civilized government, because there can be no government without laws, and without courts to provide the interpretation necessary to the enforcement of the laws. Such a preachment therefore tends to the destruction of all government and the enthronement of anarchy.

Proposal to Repeal Labor Provisions

of Transportation Act

Another incident of this self-styled progressive movement is its purpose to repeal the labor provisions of the Transportation Act, because that enactment throws obstacles in the way of railway strikes, even though it does not expressly forbid them. Since its passage, nearly two years ago, there has been but one strike of any magnitude, although about 9,000 disputes have been decided by the Railroad Labor Board, including all the difficult questions of after-war readjustment of wages and revision of working rules. The one strike

referred to wrought incalculable damage to the country, particularly to the farmers, but the mere fact that the matters in issue had been tried and decided by a government tribunal deprived the strikers of any considerable part of the public support essential to their success. Here is a condensed recapitulatory analysis of the various steps in the program of this new alliance:

1. To deprive the courts and all other tribunals of the power to obstruct strikes and to restrain strikers from the use of force.

2. To curtail both state and national troops so that the government cannot successfully use them to protect employers, workers and the public from the violence of strikes.

3. To subordinate the judicial to the legislative branch of the government and to emasculate the written constitution so that sweeping changes in our political and industrial system can be speedily accomplished.

4. Having consummated the first three items of this platform, the logical sequence which our people would inevitably be called upon to face would be the conversion of the republic into some sort of a socialistic or communistic government or dictatorship of the proletariat. This is why the socialists co-operated so cordially in the Cleveland conference. Of course, it is not asserted that all of the participants in that conference contemplated the end here described.

This conference has organized what is equivalent to a third party, but it proposes to submerge its identity for the present and to operate inside the party lines of the two old parties. It is to participate in party primaries alternately and impartially, and then, whenever both primary results are not satisfactory, it is to nominate candidates of its own.

The gentle persuasive democratic methods of political discipline it will doubtless employ are set out in the September number of The Brotherhood of Locomotive Firemen and Enginemen's Magazine, as follows:

Political Traitors as Bad as Strike Breakers

Information has come to us that certain individuals claiming to be Brotherhood men are working for Albert J. Beveridge, candidate for United States Senator from Indiana, and these individuals or any other Brotherhood or Union members, who may be contemplating a course of this kind, might as well understand that their support of Beveridge and men like him will mean that they will be classed with strike breakers in the estimation of all honest wage earners who know of their perfidy.

The severity of this threat can be understood only by those who are familiar with the loathing and contempt in which strike breakers are held by professional labor leaders and the merciless way in which they are treated.

It is this kind of intensified and unreasoning class spirit which caused the leaders of the Russian workers to anathematize a dictatorship and then to set up one of their own, to rebel against military oppression and then to create a military despotism, to advocate freedom of the press and then to throttle it when their time came, to plead the cause of the laboring man and then to make him a voiceless, helpless conscripted toiler in a condition approximating peonage.

And this is the lesson for the sensible American working man—the danger of following off after leaders who call themselves progressive, but who are, in every sense, reactionary, who hastily propose to throw into the discard the best government the world ever saw, who seek to set up physical force above the law, and whose program, according to all human precedents, would plunge our country into the depths of poverty, crime, misery and despair.

This radical movement to manipulate a bloc vote in the two political parties so as to control both will have to be met by intelligent, patriotic and non-partisan action upon the part of the great conservative-progressive element of the country. It will require a show of strength to prevent time-

serving politicians from prostrating themselves before this pretentious class array.

Let us charge up the radicalism that is extant in our country to three causes, namely: the miasma that has floated across the sea from Europe; the inherent restlessness of certain types of men who always magnify the ills around them; and, most important of all, the fact that the gigantic growth of modern industrialism has created inequalities and injustices that call for readjustment. To this latter task, thinking men must address themselves and that with alacrity.

No word here written is intended to discourage the aspirations of laboring men for the betterment of the condition of themselves and their dependents. The standards of living for the worker have constantly moved forward in our republic. This process must continue, and, in an organized and collective way, labor must strive for its furtherance. It is a consummation, however, that cannot be attained by force nor accelerated by the legerdemain of political wonder-workers.

THE SOUTHERN PACIFIC has made provision whereby purchasers of old ties may buy them directly from section foremen or station agents.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended March 3 not only showed an increase of over 87,000 cars as compared with the week before, which contained a holiday, but the total, 917,896 cars, was higher than was reached last year until the week of September 2, in 1921 until October 14 and in 1920 until June 10. The increase as compared with the corresponding period of last year was 124,781 cars and as compared with 1921 it was 206,529 cars. The loading of grain and grain products and coal was less than during the corresponding week of last year and l.c.l. merchandise showed a falling off, which indicates that more goods are being shipped in carload lots, but miscellaneous freight showed an increase of 86,289 cars and livestock, coke, forest products and ore also showed gains.

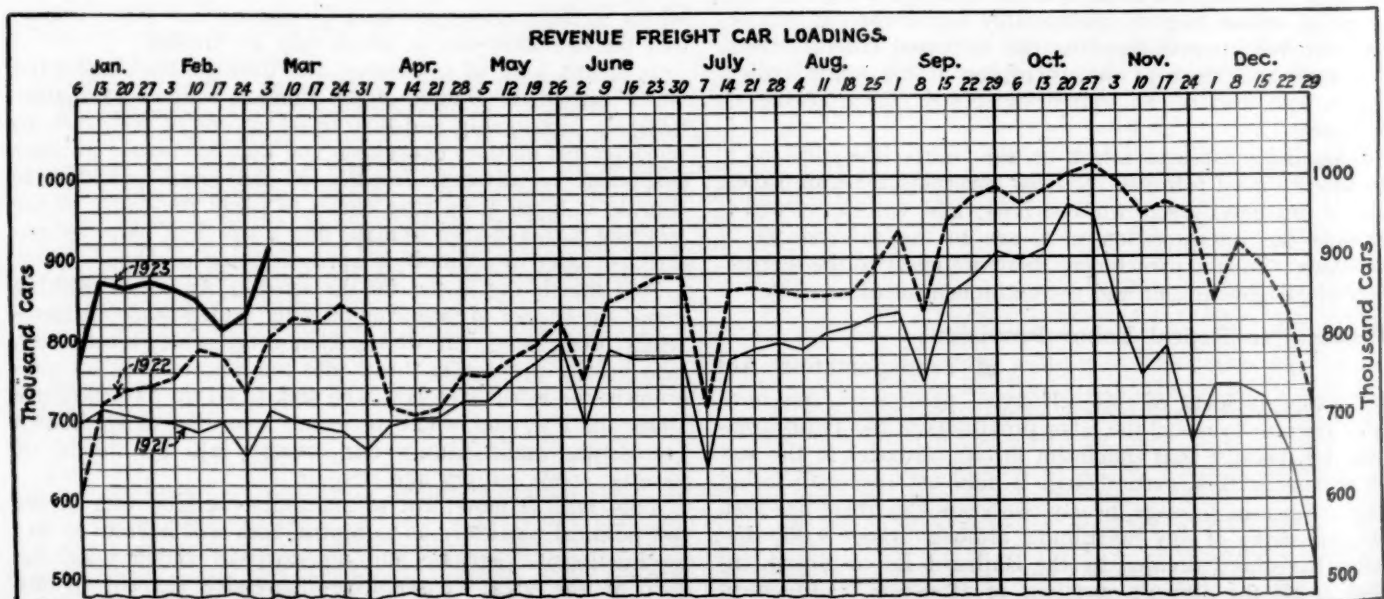
The freight car shortage increased during the week ended February 28 to 80,633 cars, or 3,733 cars more than the average for the preceding week. This included 33,857 box cars and 38,771 coal cars. The surplus was reduced to 15,819.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS. COMPARISON OF TOTALS, THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, MARCH 3, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded		
										1923	1922	1921
Eastern	1923	6,966	3,011	55,704	4,076	6,784	1,979	59,359	82,107	219,986	.....	.....
	1922	9,865	2,502	51,386	2,005	4,950	805	65,029	64,072	.....	200,614	168,509
Allegheny	1923	2,677	2,492	53,313	7,244	3,470	2,385	44,697	78,107	194,385	.....	.....
	1922	3,155	2,454	55,302	3,869	2,340	1,397	49,016	52,567	.....	170,100	139,846
Pocahontas	1923	243	67	23,356	777	1,604	210	6,138	3,987	36,382	.....	.....
	1922	266	60	25,579	241	1,100	9	5,954	3,553	.....	36,762	23,509
Southern	1923	3,792	2,220	25,501	1,481	23,121	1,410	39,522	50,828	147,875	.....	.....
	1922	4,126	2,246	25,349	523	15,096	485	37,189	36,789	.....	121,803	111,758
Northwestern	1923	15,351	10,706	9,684	2,044	23,395	933	27,970	34,531	124,634	.....	.....
	1922	13,011	8,681	9,933	1,199	13,255	501	26,233	24,227	.....	97,040	98,889
Central Western	1923	11,736	12,157	20,910	398	9,340	3,051	34,453	46,866	138,911	.....	.....
	1922	14,132	9,895	23,146	325	4,930	869	32,134	32,776	.....	118,207	109,396
Southwestern	1923	4,202	2,157	5,083	118	8,417	559	14,679	20,508	55,723	.....	.....
	1922	4,527	2,065	5,275	196	5,332	652	13,881	16,661	.....	48,589	59,460
Total West. Dists.	1923	31,289	25,020	35,677	2,560	41,152	4,563	77,102	101,905	319,268	.....	.....
	1922	31,670	20,641	38,354	1,720	23,517	2,022	72,248	73,664	.....	263,836	267,745
Total all roads	1923	44,967	32,810	193,551	16,138	76,131	10,547	226,818	316,934	917,896	.....	.....
	1922	49,082	27,903	195,970	8,358	47,003	4,718	229,436	230,645	.....	793,115	.....
	1921	41,885	28,424	141,748	7,686	51,480	7,434	204,212	228,498	.....	.....	711,367
Increase compared	1922	.....	4,907	.....	7,780	29,128	5,829	.....	86,289	124,781	.....	.....
Decrease compared	1922	4,115	.....	2,419	.....	.....	.....	2,618	.....	.....	.....	.....
Increase compared	1921	3,082	4,386	51,803	8,452	24,651	3,113	22,606	88,436	206,529	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March 3	1923	44,967	32,810	193,551	16,138	76,131	10,547	226,818	316,934	917,896	793,115	711,367
February 24	1923	40,364	32,400	178,457	14,913	69,891	10,420	201,390	282,328	830,223	728,925	659,642
February 17	1923	40,179	30,274	180,988	14,912	59,431	9,816	208,913	273,265	817,778	773,275	692,007
February 10	1923	40,939	32,277	190,860	15,188	64,310	10,110	216,323	283,282	853,289	777,791	687,867
February 3	1923	41,736	33,675	189,773	14,199	69,767	11,239	216,876	288,410	865,675	747,895	699,718

Compiled by the Car Service Division of the American Railway Association.



Railway Engineer Battalions for Reserve Army

36 Units to Be Allocated to Railway Systems Instead of Corps Areas

A NEW PLAN of organization for the railway units of the six field army reserve now being organized by the War Department has recently been authorized by Adjutant General H. H. Tibbetts, which provides for the creation of 36 railway engineer battalions, each to be formed from among the officials and employees of a railway system and each to be designated by the name of the railway. Each battalion will consist of a headquarters platoon and three companies, one for operation, one for maintenance of equipment, and one for maintenance of way, and in the event of war or a national internal emergency (declared by Congress) they would perform much the same service as that of the railway regiments which were organized after the United States entered the war with Germany.

The Six Reserve Armies

The six reserve armies are being organized on a skeleton basis which represents a full war strength of 2,000,000 men. Of these 300,000 would be engineers, including the 36 railway battalions of 18 officers and 560 men each at full war strength. The authorization for the railway units was issued by the adjutant general in instructions addressed to the commanding generals of the nine corps areas of the army organization, after the detailed plan of organization had been worked out in the office of the chief of engineers, General Lansing H. Beach, and approved by the general staff. A number of railway engineer battalions had previously been formed but due to the impracticability of maintaining such organizations in the regular army or of organizing such battalions in the National Guard, all previous allocations of such battalions under the six field army project have been revoked and the new allocation to existing railway systems substituted in general accordance with the table which is given herewith. This shows the possible allocation of 44 battalions but it is to be reduced by selection to the 36 which have been authorized.

Plan Suggested by Railway Officer

The general idea of the plan was suggested to the War Department by Lieut. Col. W. G. Arn, assistant chief engineer, Chicago terminal improvement, of the Illinois Central, who is an engineer reserve officer and served in France during the war with the Thirteenth Engineers (Railway). Previously the reserve program called for organization of the railway units by corps areas, whereas the new plan relieves the railway battalions from the corps area restrictions, the personnel to be drawn from the entire railway system to which the unit is allocated, so that in event of mobilization not more than 5 per cent of the necessary personnel of the railroads would be drawn upon. The organizations now proposed would be less than 2½ per cent.

Comparatively few reserve officers are now actually employed in railway operation and maintenance but under the new plan the officers will be selected from railroad officials who will be thoroughly competent to fill their battalions on short notice with men whose abilities are known to them and the railway employees who join would answer a call to the colors under the command of the same men who direct their work in peace time and in company with their regular associates.

Allocation of Battalions

It is proposed that engineer battalions (railway) be organized in accordance with the following tables:

WASHINGTON, D. C.

	G.H.Q. Reserve	Communications zone	Total
1st Corps Area.....	2	2	2
2nd Corps Area.....	2	2	4
3rd Corps Area.....	2	2	4
4th Corps Area.....	2	2	4
5th Corps Area.....	1	3	4
6th Corps Area.....	1	4	5
7th Corps Area.....	2	4	6
8th Corps Area.....	1	2	3
9th Corps Area.....	1	3	4
	12	24	36

POSSIBLE ALLOCATION OF 44 ENGINEER RAILWAY BATTALIONS TO RAILROAD SYSTEMS IN THE UNITED STATES

Corps area	Railroad	Battalions	Total mileage operated	Mileage operated in C. A.	Probable Headquarters
I	N. Y., N. H. & H. Boston & Maine...	1	1986	1940	Boston
II	N. Y. Central.....	(3)	(6078)	2819	New York & Buffalo
	Lines east of Buffalo	2	4002	1090	Hoboken
	Erie	1	1989	701	
	Lackawanna	1	956	802	
	Lehigh Valley.....	1	1449	442	
	Central of N. J.)	4	686		Jersey City
III	Penna.	(3)	(7322)	4610	Philadelphia
	Eastern Region..	1			Pittsburgh
	Central Region..	1		1127	Baltimore
	B. & O.	(2)	(5155)	787	Richmond
IV	Eastern Lines.....	1	2539		
	Chesapeake & Ohio.	1	2539		
	Southern	(2)	6971	5390	Charlotte
	Lines East.....	1			Birmingham
	Lines West.....	1			Wilmington, N. C.
	Atlantic Coast Line.	1	4888	4741	Norfolk
	Seaboard Air Line.	1	3563	3405	Savannah
	Central of Ga.....	1	2583	2583	
	Louisville & Nash..	(2)	(5043)	2853	
	Lines South of Nashville	1			Birmingham
	Ill. Central.....	(2)	(4799)	1104	
	Lines South of Cairo	1			Memphis
V	N. Y. Central.....	(3)	(6078)		
	Lines West of Buffalo	1	2076	1145	Cleveland
	Big Four.....	1	2421	1708	Indianapolis
	Penn.	(3)	(7322)	1445	
	N.W. & S.W. Regions	1			Columbus
	B. & O.	(2)	(5155)	3558	Cincinnati
	Western Lines.....	1			
	Louisville & Nash..	(2)	(5043)	2853	
	North of Memphis, Nashville & Atlanta	1			Louisville
VI	Ill. Central.....	(2)	(4799)	2068	
	North of Cairo..	1			Chicago
	Chicago G. W.....	1	1496	177	Chicago
	Northwestern	(2)	(8402)	3495	
	Eastern Lines.....	1			Chicago
	C. M. & St. P.....	1	7927	2292	Chicago
	Burlington	(2)	(9390)	2030	
	Lines East.....	1			Chicago
VII	Northwestern	(2)	(8402)	4907	
	Western Lines.....	1			Omaha
	N. P.	(2)	(6809)	2560	St. Paul
	East of Mandan..	1			Minneapolis
	Soo Line.....	1	4242	2370	
	G. N.	(2)	(8170)	4374	
	Lines East.....	1			St. Paul
	U. P. System.....	(2)	(9366)	2408	
	U. P. Ry.....	1			Omaha
	Mo. Pacific.....	1	7300	5993	St. Louis
	Rock Island.....	1	7663	5346	Des Moines
	Burlington	(2)	(9390)	6020	
	Lines West.....	1			Omaha
	Santa Fe.....	(2)	(8830)	3222	
	Eastern Lines.....	1			Topeka
	St. Louis & S. F..	1	4760	2950	Springfield
VIII	S. P. Lines.....	(2)			
	In Corps Area..	1		3209	Houston
	Santa Fe.....	(2)	(8830)	3782	
	Western Lines.....	1			Amarilla, Tex.
	M. K. & T. of Tex.	1	1740	1720	Dallas
IX	N. P.	(2)	(6809)	4032	
	West of Mandan..	1			Tacoma
	G. N.	(2)	(8170)	3070	
	Lines West.....	1			Seattle
	U. P. System.....	(2)	(9366)		
	Associated Lines.	1	5752	5752	Salt Lake City
	S. P.	(2)			
	In Corps Area..	1		6414	San Francisco

The above tentative allocation allows one battalion to about 2,000 miles of railroad in the territory east of the Mississippi and to 3,500, or more in territory west of the Mississippi, where the density of traffic is less. Exceptions are the Chicago Great Western and the Missouri, Kansas & Texas of Texas. The former is included because its president, S. M. Felton, was director general of military railroads during the late war and can be depended upon to give material assistance in the organization of railway battalions. The latter is tentatively included due to its special importance in the VIII Corps Area. It is estimated that less than 2½ per cent of the operating personnel of the above railroads will be required for filling to full war strength the battalions allocated to them and many smaller roads could be enlisted.

Where the table shows a greater number than is available the selection is left to the commanding general of the corps area indicated and will probably be determined by the attitude of the railway officers. The numerical designations formerly selected for the organization of reserve engineer battalions (railway) will not be disturbed but as a means of more definitely identifying the railway battalions with the railway systems, it is proposed to couple the numerical designation with the names of the railroads, as for example, 324th engineer battalion (railway) (New York Central). Where a railroad is to furnish a single battalion the personnel of the entire railroad is available to the corps area commander. It is assumed, however, that personnel residing more or less permanently in the corps area concerned will be utilized so far as possible. Where a railroad is to furnish more than one battalion and their headquarters are located in different corps areas, the division of the personnel may be adjusted by mutual agreement between the commanders concerned. The work of organization has already been started in the III Corps Area, in accordance with the tentative allocation.

In cases where railway battalions have been organized or partly organized under previous instructions the personnel will be reassigned to other types of engineer units unless employed by the railroads to furnish the battalions under the present plan. The battalions are to be railway operating and maintenance units only. Railroad construction in the theater of operation will be done by general service engineer regiments, and engineer battalions, auxiliary. Since the three companies to be included in each battalion are to perform different functions it may or may not be found expedient to allocate the companies to different operating divisions of the railroad. All companies may, if desired, draw personnel from all parts of the battalion limits since one company requires operating personnel, one shopmen and one maintenance of way men.

For the successful organization of railway battalions by railway systems it will be necessary to interest the proper railway officers where that has not already been done, and to persuade them to apply for commissions in the reserve corps. In most cases the corps area engineers have interviewed railway officers as to the practicability of the scheme. The following railway officials are suggested as logical appointees to the rank indicated:

Division Superintendent.....	Major, Battalion Commander
Trainmaster.....	Captain, Operating Company
Assistant Trainmaster.....	Lieutenant, Operating Company
Terminal Trainmaster.....	Lieutenant, Operating Company
Division Engineer.....	Captain, Maintenance of Way Company
Assistant Division Engineer.....	Lieutenant, Maintenance of Way Company
Division Master Mechanic.....	Captain, Maintenance of Equipment Company
Assistant Division Master Mechanic.....	Lieutenant, Maintenance of Equipment Company

As the designation of officials performing similar duties may vary on different railroads, this list is not considered exclusive.

The recruiting of the railway battalions to full war strength, 18 officers and 560 enlisted men to a battalion, has

already been authorized, but it is not expected that the full war strength will necessarily be attained as some difficulty may be encountered in accomplishing this and it is not considered necessary that the complete personnel of each unit shall be enlisted. Also, if it is found impossible to enlist sufficient men with the necessary qualifications, positions such as sergeant-majors, first sergeants, clerks, etc., are to be filled by the enlistment of employees in the clerical and administrative offices of the railroads and if sufficient trainmen, for example, cannot be enlisted, the company commander is to keep lists of such men as can be depended upon to enlist immediately in the event of war or national internal emergency. These men would require no technical training in their usual occupations and if the first sergeants have been instructed in military administration it is believed that the battalions will be able to function efficiently.

Instructions for Railway Battalions

A manual of instructions prepared in the office of the chief of engineers outlines the work of the railway engineer battalions as follows:

(a) Railway Engineer battalions are assigned to G. H. Q. reserve or the communications zone for the operation and maintenance of railways in the theater of operations.

(b) The number of these battalions needed will vary widely depending upon the size of the expedition, and character and extent of the theater of operations and existing railway facilities. The allotment of railway battalions as shown in the approved organization project is to be considered as a minimum for initiating military operations, and as the theater of operations is extended and the need for more extended railway operations is foreseen, additional railway battalions will be organized as required.

(c) Each railway battalion includes the personnel necessary for operation, maintenance of way, and maintenance of equipment for one railway operating division. This personnel for purposes of recruiting, organization, and control along lines similar to that in use in civilian railway practice, is generally grouped into one operating company, one maintenance-of-way company, and one maintenance-of-equipment company. Such an initial grouping should not, however, in any way interfere with the utilization of the personnel where most needed in the railway division, and by mutual transfer and assignment any one of the three railway activities can be provided with increased or decreased personnel to meet the needs of special situations.

(d) The railway battalions will be equipped with special railway tools including all those necessary for the ordinary maintenance and operation of railways. They will not be provided with riding horses or animal-drawn transportation, nor will they be provided with sufficient motor transportation for transporting all their equipment. Movements of railway battalions from place to place will normally be by rail, and it is contemplated that their equipment will always be carried in railway cars.

(e) Railway battalions may be used for the operation and maintenance of standard gage or narrow gage railroads, and may be assigned temporarily to armies for such use.

(f) The initial construction of railways as distinguished from maintenance, is not the duty of railway engineer battalions. Such work is normally done by general engineer troops assisted when necessary by auxiliary engineer battalions or civilian labor.

Organization of a Railway Battalion

A headquarters and service platoon at war strength will include a division superintendent with rank of major; assistant division superintendent, signal engineer and chief dispatcher, adjutant and supply officer, with rank of captain; three first lieutenants, including dental corps and relief agent; three master sergeants, as assistant chief dispatcher, roundhouse foreman and wrecking foreman; seven technical sergeants, including assistant yardmaster, bridge foreman, car repair foreman, personnel sergeant, sergeant major, supply sergeant, and track foreman; three staff sergeants, including one medical sergeant and two dispatchers; seven sergeants, including two medical sergeants, line foreman,

mess sergeant, personnel sergeant, supply sergeant and telegrapher; nine corporals, including bugler, dispatcher, lineman, mail corporal, signal repairer, telegrapher, two towermen and miscellaneous, and 64 privates, including carpenters, chauffeur, clerks, cobblers, cooks, draftsman, linemen, mail orderly, mechanics, medical technician, motorcyclists, crane operator, telegraph operator, signal repairers, towermen and miscellaneous.

A maintenance of way company will include an engineer maintenance-of-way, with rank of captain; two first lieutenants as track supervisors and in charge of bridges, buildings and water service; a second lieutenant, a first sergeant, and five staff sergeants, including two foremen, two master carpenters and one miscellaneous; 13 sergeants, including two carpenters, three foremen, one mechanic, one mason, one mess sergeant, one structural iron worker, one supply sergeant and three miscellaneous; 18 corporals, including one blacksmith, one carpenter, one crew dispatcher, one mason, one painter, eight section hand foremen, one structural iron worker and four miscellaneous; 123 privates, including 7 blacksmiths, 2 buglers, 15 carpenters, 1 chauffeur, 1 clerk, 3 cooks, 1 mail orderly, 4 masons, 4 mechanics, 4 painters, 2 pipe fitters, 2 storekeepers, 7 structural iron workers, and 70 miscellaneous.

A maintenance of equipment company will include a captain as division superintendent of motive power; two first lieutenants as mechanical engineers, and one second lieutenant;

one first sergeant, five staff sergeants, including three foremen, one master blacksmith, and one master carpenter; 13 sergeants, including one air brake expert, two blacksmiths, one boilermaker, one carpenter, one electrician, one foreman, one machinist, one mechanic, one mess sergeant, one supply sergeant, one wrecker and one miscellaneous; 18 corporals, including one air brake man, one blacksmith, one boilermaker, three car inspectors, one carpenter, one crew dispatcher, one electrician, one machinist, one mechanic, one painter, three wreckers and three miscellaneous; and 123 privates, including 7 air brake men, 13 blacksmiths, 7 boiler-makers, 2 buglers, 12 carpenters, 1 chauffeur, 1 clerk, 3 cooks, 6 electricians, 1 crane fireman, 6 machinists, 1 mail orderly, 4 painters, 1 pipefitter, 2 storekeepers, and 56 miscellaneous, including wrecking crews.

An operating company will include one captain as trainmaster; two first lieutenants as yardmaster and road foreman of engines; and one second lieutenant; one first sergeant; five staff sergeants, including assistant road foreman of engines, assistant yardmaster, inspector, station agent and traveling foreman; 13 sergeants, including 8 conductors, 1 mess sergeant, 2 station agents, 1 supply sergeant, and 1 traveling foreman; 18 corporals, including 14 conductors, 1 crew dispatcher, and 3 station agents; and 123 privates, including 2 buglers, 2 carpenters, 1 chauffeur, 2 conductors, 1 clerk, 3 cooks, 24 locomotive engineers, 24 locomotive firemen, one mail orderly and 63 miscellaneous.

Transportation and Car Distribution*

Railroad Managements Are Interested in the Problem— Real Money and Stage Money

By M. J. Gormley

Chairman, Car Service Division, American Railway Association

It is well known to all that the principal difficulties in the way of transportation during 1922 resulted from the strike of the railway shop crafts, the first nation-wide strike of the railway employees that ever took place in the country. The five months' strike of the miners also threw an extraordinarily heavy burden on the railroads during the fall months at a time of a heavy seasonal movement of other commodities.

There has been some criticism of the railroads for their failure to meet the coal transportation necessities, and while there have been some pretty tight situations in a certain small section of the country as to anthracite coal, nevertheless the fact remains that there was fuel to meet all demands even in those territories, although probably of not just the exact kind wanted. That condition is more largely attributable to the five months' strike of the anthracite miners and extraordinarily severe weather conditions than to any other cause. The anthracite mines opened in September and from September 15 up to and including February 24 they loaded 882,989 cars, an increase of 122,391 cars, or 16.1 per cent, over the same period of the previous year.

A great deal has been said about how the agricultural interests have suffered by reason of the transportation conditions, but we call your attention to the figures which show that there were 174,579, or 7.6 per cent more cars of grain and grain products loaded during 1922 than 1921, and 624,340, or 33.9 per cent, more cars of grain and grain products than were loaded during the year 1920 (the largest crop year of the past five years). There were no strikes in effect during

the crop movement season to interfere with transportation during either of the two previous years.

There is no denying the fact that it was not possible for the railroads to furnish a car for grain movement every time a car of grain was ready to move, but the figures published by the Department of Agriculture show the grain production of the past four years and the amount left on the farms on March 1 of each of those four years. This indicates that the 1922 crop was larger than the 1921 crop. The amount on farms to production on March 1, 1923, was approximately 4 per cent less than the previous year and 11 per cent less than the year prior to that. In other words, a greater proportion of the 1922 crop was moved prior to March 1, 1923, than on any of the three previous years.

While we have not the complete records, we believe the locomotive plants are now booked to their capacity up to August 1 and the car plants we believe are booked to almost their capacity for the year. So far as any record we can find discloses, there are a greater number of cars on order than ever in the history of the roads at this time of the year. In addition, there has been a reduction of 134,237 in the number of cars awaiting repairs on February 15, 1923, as compared with June 1, 1922.

We do not have a record of appropriations made for various other improvements for adding to the transportation capacity of the railroads, but if that could be shown we believe that the total would be an impressive indication that the railroads are energetically going ahead to meet the transportation necessities of the country.

While the figures would appear to indicate that there has

*From an Address to the Cincinnati Traffic Club, Cincinnati, Ohio, on March 13, 1923.

not been a very large addition to the cars or locomotives of this country since 1912 your attention is directed to the fact that there has been a 22 per cent increase in that period in the carrying capacity of cars and a 40.8 per cent increase in the total locomotive tractive power. In other words, the increases made are in the interest of increased efficiency by provisions to carry the tonnage in less car units and in less trains by reason of the addition of larger locomotives. Coincident with this improvement, of course, has been the reduction of grades and various other items that look to greater efficiency and greater economies in transportation. The greatest possibilities in the way of reducing transportation costs in the future, in my opinion, lie in the direction of improvements that will add to transportation capacity and likewise reducing its cost.

One significant thing is the fact that the increased carrying capacity of cars has without doubt increased at a greater ratio than has the loading per car and one of the greatest economies in the future lies in the direction of utilizing to the greatest possible extent the full carrying capacity of equipment.

There has been very little change in the tariff minimums during the period that the carrying capacity of equipment has increased 22 per cent. In the interest of economical transportation serious consideration should be given by all interested to increasing these minimums to the greatest extent practicable consistent with the character of the commodity moved.

There existed during the first eight months of 1922 an average daily surplus of equipment for the entire country of 270,750 cars. The severe shortage began about September 1 with a shortage of 58,670 cars and reached a peak point of 179,239 cars on October 31. Since that time it has receded to 80,633 cars, the latest figures. The demand continues unabated. From 1912 to 1922 this country experienced 30 months of car shortage with a maximum at any one time of 179,000 cars. During the same period there has been 90 months of surplus with the surplus cars reaching a maximum of 495,000 cars.

A great many people attribute the difficulties during 1922 to a lack of cars and make the statement that what is needed is additional cars and some new theoretical way of handling them. We believe the records will justify the statement that the shortage in 1922 was more largely made up of transportation shortage than car shortage. In substantiation of this statement, we have figures to indicate that if all of the cars of the country during the months of September, October and November, 1922, had moved at the rate of 30 miles per car per day, instead of the average actually made of 25.9 miles per car per day, it would in effect have resulted in adding 333,903 cars to the ownership. Likewise, if all of the cars of the country had been loaded to an average of 30 tons per car, a figure attained in the past at different times, instead of the actual average of 27.7 tons per car, it would in effect have added 188,357 cars to the ownership.

The greatest necessity today is the adding of improvements that will move the car faster and action on the part of all interested to utilize it to more nearly its carrying capacity. This involves locomotives, additional main lines, extension of yard facilities, enlarged shops, enlarged enginehouses, and in our opinion, lastly comes the question of additional freight cars.

The adding of cars generally means that for every dollar you spend for equipment, you must spend three dollars for other improvements. Certainly, it is wisdom to spend the money for the things that will give the greatest efficiency to the present equipment instead of making large capital expenditures for new equipment over and above the present ownership, which would mean a greater idle capital during periods of surplus. The equipment companies of the country, in our opinion, can be kept busy constructing cars to take

care of the retirements of old cars without adding any very great number of car units to the present supply. It should be remembered in contemplating car shortage that it undoubtedly represents a greatly inflated demand beyond the ability to load. Shippers are very likely in times of severe shortage to order more cars than they can load daily and which they would not do in times of car surplus. We do not know how much the shortage should be discounted, but we are endeavoring to impress upon all interested the necessity for having this figure correctly indicate the actual situation.

You have recently heard the details of a plan that is proposed to alleviate all the ills of the shipper and the railroads by pooling the equipment of the country and likewise pooling the finances for acquiring equipment. You have heard that the present arrangement is ineffective to meet the demands of the country and that the present machinery cannot or will not meet the necessities of the shippers. In ordinary times the free working of the Car Service Rules, which briefly mean that the cars should be moved either loaded or empty to the owner, will distribute the equipment over the country in an equitable manner and as an evidence of this the records will show that there existed on July 1, 1922, at the time of the shop strike, the most even distribution of box cars throughout the entire country that had existed in a number of years, and this includes the period of government control when all cars were pooled.

The conditions incident to the shop strike created a number of emergencies and increased the difficulty of handling equipment both loaded and empty. In meeting these conditions there was the fullest possible co-operation and harmony between the Interstate Commerce Commission, the Car Service Division and the railroads. While the commission has full authority under the law to instruct how equipment shall be distributed, it was not necessary at any time during the past year for them to issue a formal order of any kind respecting car distribution, nor has such an order been issued by them but once since the railroads were turned back after federal control. That case was directly the result of the switchmen's strike in the early part of 1920. So far as the railroads are concerned our authority has never been questioned, and there has been a most satisfactory voluntary co-operation between individual carriers in adjusting car distribution problems. The Interstate Commerce Commission has kept the Car Service Division fully informed at all times of reports coming to them of conditions, either from their own inspection force or from outside sources.

All orders issued for the movement of equipment during the year 1922 were initiated alone by the Car Service Division. The service orders issued by the commission in 1922 were for the purpose of free routing of traffic, necessitated by congestions due to strike of the shop crafts and for the purpose of confining the use of coal cars to the coal trade to meet the fuel necessities of the country.

As an illustration of action taken to meet the agricultural requirements there have been moved on one general order since October, 1922, from eastern roads to western connections a total of over 103,500 empty western ownership cars, and nearly half of this number were put into solid trains at Chicago and moved to the points where the greatest needs existed, regardless of the ownership of the cars involved. Similar action has been taken in the distribution of coal cars, the effect of which was particularly marked during the period of the strike when loading was largely concentrated on two or three roads, and it was necessary to divert cars to them regardless of ownership.

There has been no factor restricting such distribution except the practical operating limits of the railroads. There is absolutely no lack of authority on the part of the Car Service Division, and certainly none on the part of the Interstate Commerce Commission. Therefore, what possible good can be accomplished by setting up a third agency to further deal

with the same questions, as is proposed by certain interests already referred to?

So far as the beneficial part of the proposed "pooling plan" is concerned, in our opinion the best answer is the fact that the railroads now have on order probably as large a number of cars as can be produced by the equipment companies of the country this year, and we believe that these purchases are being financed under the most favorable terms. Equipment trusts have always been considered a desirable investment by the public.

Just as an indication that important agricultural interests consider that the Car Service Division has secured fairly satisfactory results in car distribution in view of existing conditions, we quote the following from the American Farm Bureau Federation:

"We believe we have told you how much we appreciated your getting some cars out on the _____ Railroad. We intended writing you much sooner. This line seems to be a poor fatherless sort of an outfit with nobody but the American Railway Association to look after the orphan. You may be sure that we, as an organization, and the shippers along the line appreciate your good efforts in getting several trainloads of cars."

This is only a sample of what has been said from a good many sources as to the action of the Car Service Division in ordering movements of cars to meet emergency conditions. All of the emergency conditions that existed were, of course, not met in a manner satisfactory to the shippers or ourselves, but it was through no lack of knowledge or effort on the part of the railroads or of the Car Service Division that this was not accomplished, but was due to causes not of their own creation.

The greatest difficulty, in my opinion, with which the railroads will have to contend in the future is to prevent various people with various interests, selfish or otherwise, from trying to act as their saviors. The railroads do not need the assistance of theoretical plans which are assumed to alleviate all of the shortages of transportation that may exist from all causes. This proposed "pooling plan" is only one of many of the suggestions offered as a basis for enormous savings of money in the operation of the railroads. Some of them are new and ingenious, or at least, plausible. Many of them are old and exploded theories about which some of the proponents have just learned. This particular plan calling for the pooling of equipment was presented in February, 1922, to the Interstate Commerce Commission at a rate hearing. Naturally any plan purporting to save three hundred million dollars per year to the railroads and also to the shippers, attracted the

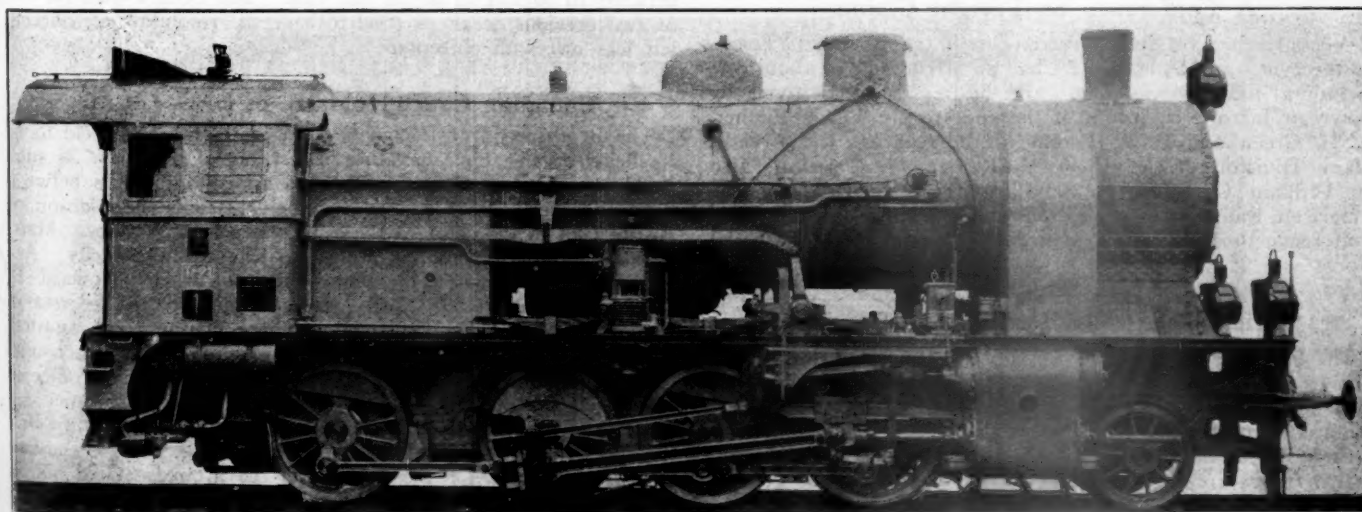
most lively interest and attention, because you may be assured that the railroads are looking for just such a proposition as this, but the railroads, like anyone else considering a proposition, before reaching any conclusions must necessarily submit it to the magnifying glass to make sure that all or any part of the purported savings are not made up of "stage money." "Stage money" will not pay wages, dividends, or any of the other obligations of a railroad. They need the real article for that.

This, however, is not the only plan for saving three hundred million dollars in the operation of the railroads. One was presented with the statement that there should be ordered a 25 per cent cut in rates on the basis of a plan that would save 36 per cent of the track maintenance on the theory that this could be done if a concrete covering were put on the railroad's roadbed. In another rate hearing it was stated that there could be a three hundred million dollar per annum saving made in the railroad fuel bill, and when you take into consideration that that is approximately one-half of the money expended yearly for locomotive fuel, it would not take a very keen mind to realize that a lot of that was made up of "stage money."

The railroads are continually looking for new methods and means of reducing transportation and maintenance expenses and they welcome any invention or improvement in methods that will bring about an actual rather than a theoretical saving.

The enthusiasm, imagination and foresight that built up the transportation machine of this country still exists in the railroads' organization of today and all that is needed to bring the railroad development up to the point where it will again lead the industrial development of the country is that everyone have a knowledge of, and those responsible for regulation and legislation carry out that part of, "Conclusion VI" in the answer of the American Railway Association to the National Security Owners' Car Pooling Plan, reading as follows:

"Primarily there should exist such an attitude towards the railroads as will convince the public that money invested in railroads will receive a fair return, thereby strengthening railroad credit and making it possible to increase railroad facilities so as to care for the growing transportation needs of the country. This can only be done by the investment of additional capital, which can be secured only by the reasonable assurance of a fair return, and this assurance will not exist unless the investing public has reason to expect from the government a liberal, stable, and not a repressive attitude."



First Locomotive Built in Poland for the Polish State Railways

General News Department

The Association of Railway Electrical Engineers will not hold a semi-annual meeting this year but the regular annual convention will be held in Chicago in October.

A fire in the yards of the Boston & Maine at Boston on March 2 destroyed 11 carloads of wool, cotton, paper and other merchandise, together with other property; estimated total loss \$100,000.

The Veterans' Association of the Lehigh Valley held its second annual banquet at the Karlton Hotel, Easton, Pa., on the evening of March 3, with an attendance of about 200. Charles L. Martin, of Easton, was chosen president of the association for the ensuing year.

The Federated American Engineering Societies are to have a committee on transportation, the chairman of which will be Max Toltz of St. Paul, Minn. Other members of the committee include P. F. Walker, W. K. Hatt, C. M. Buck, W. H. Hoyt and J. S. Barelli.

T. W. Krein, general manager and receiver of the Muscatine, Burlington & Southern, Muscatine, Iowa, was sent to Leavenworth, Kan., on March 2, to serve a year's sentence in the federal prison. He was sentenced following a plea of guilty to accusations of deliberate overcharges by his road against other carriers for car repairs.

The Atlanta, Birmingham & Atlantic Railway Benefit Association held its annual meeting at Atlanta, Ga., on March 6. Colonel B. L. Bugg, receiver of the road, was elected president of the association and G. M. Gentry, secretary. This association, less than a year old, already has disbursed about \$8,000 in payment of claims on 267 cases of injury or illness.

Radio communication was used by the Illinois Central last Monday to get in touch with trains in territory cut off from regular communication by failure of wires during a storm. A message was sent out from two Chicago broadcasting stations requesting listeners to make inquiry of train dispatchers in their vicinity, and report. The Hawkeye Limited, stormbound west of Freeport for 10 hours, was thus located.

The Southern's Expenditures for Equipment

New cars and locomotives costing \$17,000,000 have been ordered recently by the Southern Railway. This is in addition to equipment costing \$13,000,000 purchased in 1922, making a total outlay of \$30,000,000 for equipment by the Southern Railway in two years.

A Conference on Freight Claims

A conference on freight claims, held at El Paso, Texas, on the evening of February 28, had an attendance of about 300, including 100 business men; and addresses were given by Bowman Jarrott, chairman of the conference; Lewis Pilcher, A. L. Green and F. E. Winburn, representing the Freight Claim Division of the American Railway Association; also by William C. Fitch, of San Francisco, chairman of the American Railway Association Freight Claim Division. The conference took the shape of a dinner at the Hotel Paso del Norte.

Erie Places New Ferryboat in Service

The Erie has placed in service between New York and Jersey City its new ferryboat "Youngstown." The new boat has seating accommodations for 750 passengers, is 224 ft. long, of 64 ft. beam and has an overguards depth of 18 ft. The vessel is similar in most of its details to the "Jamestown," placed in service previously. There are two decks, the greater part of the lower deck being given over to the transportation of vehicles. From the

upper saloon there are four stairways, two at each end, leading out directly under the hood. The boat was built by the Staten Island Shipbuilding Company, New York.

Questionnaire on Freight Cars

The American Railway Association has recently sent out Circular No. 2350 requesting from the railroads information regarding freight cars owned, the original cost and the cost of maintenance for the year 1922. The first part of the circular is arranged for a report of the average number of cars maintained and the total charges for repairs, retirements, depreciation and taxes. In the second part of the circular the equipment is separated according to type and each type is sub-divided into groups according to capacity. Data is requested under each of these divisions covering the number of cars owned, the original cost of cars, the number of cars destroyed and acquired, the average age of cars and the total number of car-years represented in each group.

May Hold Hearings on Warfield Plan

Press dispatches from Iowa have quoted Senator Cummins, chairman of the Senate committee on interstate commerce, as announcing his intention to hold hearings in May or June on the bill proposed by the National Association of Owners of Railroad Securities to carry out the plan of central control of railway equipment. At the office of the Senate committee it is stated that such hearings may be held in Chicago, particularly for the purpose of receiving the testimony of railroad officers and others. The proponents of the bill have been heard by the committee in Washington in connection with the hearings on the general investigation of the railroads under Senate resolution No. 23. The Senator also hopes to prepare a report on this investigation before the next session of Congress.

President Requested to Renew

Effort to Settle Shop Strike

It was erroneously stated in last week's issue that the Senate resolution proposed by Senator Sheppard, of Texas, "That the President of the United States be requested, in his discretion, to renew his offices in bringing about a settlement of pending controversies between certain railroads and railway shopmen," was not considered before the adjournment of Congress. A seven-line item in the Congressional Record discloses that the resolution was "considered by the Senate and agreed to," by the simple process of the absence of vocal objection, a few minutes before the Senate recessed, at 1:36 a. m., Sunday, March 4, until the final session between 10:00 and 12:00 on that date. The Senator had on one or two previous occasions tried to have the resolution considered, but was met with objection.

Canadian Court Holds B. of L. E. Illegal

The Brotherhood of Locomotive Engineers has been held to be an illegal organization, operating in restraint of trade, and as such unable to come to a court of law to adjust differences between itself and members of its organization—this was the decision of Justice Galt in the court of the King's Bench in Winnipeg, Man., on March 10, as reported in press dispatches from that city. According to the reports, the action was started by Howard B. Chase and Wilmot H. Nash, general chairman and secretary-treasurer of the Canadian division of the brotherhood, against Samuel Starr, former secretary, to compel him to give an accounting of funds in his possession when he was relieved from office in May, 1921, at the triennial convention in Cleveland. Starr refused to give up his office, claiming he had never been notified that his services were dispensed with. The court granted a non-suit motion of counsel for the defense on the grounds stated above. It is understood that appeal will be taken to a higher court.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1923

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.	Traffic.					
Akron, Canton & Youngstown.....	170	\$175,984	\$906	\$185,543	\$26,133	\$19,473	\$6,879	64.20	\$67,881	\$55,131	\$33,281	\$33,281
Alabama & Vicksburg.....	141	237,884	60,494	318,911	35,774	47,473	8,699	69.60	116,258	68,771	9,088	9,088
Vicksburg, Shreveport & Pacific.....	173	235,460	96,079	330,642	48,862	59,323	10,457	71.30	123,946	103,407	66,984	66,984
Ann Arbor.....	293	386,159	44,198	446,459	28,882	141,142	9,332	91.70	409,287	14,730	3,855	3,855
Atchafalaya, Tonoloway & Santa Fe.....	8,918	11,399,051	3,826,238	16,448,900	1,464,326	3,723,055	290,676	68.40	5,204,487	3,841,764	3,964,563	3,964,563
Gulf, Colo. & Santa Fe.....	1,908	1,635,414	332,182	2,069,874	368,067	456,275	47,487	78.20	1,618,150	370,827	295,883	295,883
Panhandle & Santa Fe.....	857	474,059	115,756	623,308	76,716	184,711	8,406	79.70	126,256	103,934	108,471	108,471
Atlanta & West Point.....	93	133,797	81,421	240,676	36,763	46,685	8,191	83.80	201,622	26,862	16,480	16,480
Western of Alabama.....	133	144,436	74,281	238,366	29,336	48,556	9,151	78.10	186,323	39,686	36,687	36,687
Atlanta, Birmingham & Atlantic.....	639	336,228	44,835	409,263	64,725	90,462	22,850	77.10	401,471	11,291	24,103	24,103
Atlantic Coast Line.....	4,860	1,821,820	1,856,802	7,115,731	753,058	1,277,398	107,693	69.30	2,423,791	1,973,442	1,920,391	1,920,391
Charleston & Western Carolina.....	342	260,725	38,190	311,036	42,078	35,010	6,281	69.90	93,618	82,560	71,883	71,883
Baltimore & Ohio.....	5,212	17,204,816	2,200,773	20,556,970	2,050,301	4,433,077	311,971	76.00	4,938,669	4,112,347	3,609,494	3,609,494
Baltimore & Ohio Chicago Term.....	96	291,731	Cr. 1,315	291,731	Cr. 1,315	36,111	1,764	81.20	238,552	10,757	48,863	48,863
Straten Island Rapid Transit.....	23	79,993	82,435	177,734	29,604	40,813	1,843	114.00	202,606	42,434	39,462	39,462
Bangor & Aroostook.....	616	395,665	81,030	496,949	115,785	120,358	4,396	91.60	41,667	8,473	47,745	47,745
Brooklyn E. Dist. Term.....	9	126,961	.....	126,961	4,928	12,671	450	52.40	65,743	59,531	59,531	59,531
Belt Ry. of Chicago.....	32	1,474,531	.....	1,474,531	34,207	73,644	2,447	68.30	196,781	163,192	173,394	173,394
Bessemer & Lake Erie.....	228	1,123,814	32,068	1,181,320	69,547	378,870	16,989	75.40	290,754	261,554	535,592	535,592
Bingham & Garfield.....	34	31,097	.....	31,097	6,062	3,821	847	73.70	8,467	4,822	17,529	17,529
Boston & Maine.....	2,286	3,661,738	1,891,943	6,313,059	1,228,476	1,656,894	49,795	79.10	5,993,319	1,293,293	1,374,520	1,374,520
Buffalo & Susquehanna.....	253	262,338	6,093	272,234	36,495	89,028	1,990	83.90	2,266,444	594,387	484,916	484,916
Buffalo, Rochester & Pittsburgh.....	589	1,918,631	154,301	2,132,575	177,842	806,086	24,617	89.10	2,317,621	196,756	301,302	301,302
Canadian Pacific (Lines in Me.).....	233	281,625	35,219	334,763	25,934	58,563	4,932	76.90	78,006	63,006	52,317	52,317
Carolina, Clinchfield & Ohio.....	309	675,639	39,158	727,584	57,841	198,603	25,018	71.20	209,325	159,294	201,692	201,692
Central of Georgia.....	1,920	1,474,531	489,175	2,159,747	275,982	415,766	25,311	80.40	422,497	321,637	325,416	325,416
Central of New Jersey.....	691	3,435,480	659,789	4,364,572	495,146	1,103,514	27,895	90.50	413,940	121,637	89,247	89,247
Central Vermont.....	532	434,366	107,360	615,795	75,948	124,997	10,721	111.30	685,535	90,303	159,642	159,642
Chesapeake & Ohio.....	2,550	6,441,183	836,247	7,642,681	821,332	2,116,697	84,179	79.10	5,993,319	1,293,293	1,374,520	1,374,520
Chicago & Alton.....	1,050	2,169,074	550,518	2,746,142	237,886	826,314	59,343	77.00	675,698	594,387	484,916	484,916
Chicago & Eastern Illinois.....	945	2,051,325	422,263	2,446,142	221,448	830,585	43,426	83.30	442,417	1,601,838	817,675	817,675
Chicago & North Western.....	8,462	9,053,811	2,350,499	12,584,310	1,178,333	3,273,564	163,748	87.10	1,613,925	861,338	756,961	756,961
Chicago, Burlington & Quincy.....	9,393	11,634,401	2,252,897	15,183,037	1,028,606	3,600,338	193,748	74.00	3,949,825	3,021,172	2,882,887	2,882,887
Chicago Great Western.....	1,496	1,586,164	278,190	1,864,354	179,004	536,086	69,167	84.20	336,170	250,191	175,471	175,471
Chicago, Ind. & Louisville.....	655	1,045,505	535,223	1,440,753	128,419	295,785	30,903	75.10	555,557	290,111	165,988	165,988
Chicago, Milwaukee & St. Paul.....	11,025	11,168,290	1,991,440	14,420,239	1,071,456	3,602,400	189,582	79.80	2,922,834	2,138,804	1,824,419	1,824,419
Chicago, Peoria & St. Louis.....	247	134,987	15,658	160,691	22,513	31,882	92,940	100.00	160,740	9,555	25,733	25,733
Chicago River & Indiana.....	28	756,874	2,133,316	10,366,391	1,306,529	2,372,668	217,219	62.80	238,277	200,226	290,025	290,025
Chicago, Rock Isl. & Pacific.....	7,635	361,973	79,768	478,504	58,227	77,069	12,448	83.20	1,601,838	1,081,244	817,675	817,675
Chicago, St. P. Minn. & Omaha.....	1,749	1,750,710	524,869	2,420,920	207,930	470,250	33,910	81.80	441,645	296,069	335,498	335,498
Cincinnati, Indianapolis & Western.....	347	351,060	44,368	426,927	29,932	86,740	10,255	81.70	77,800	58,473	15,467	15,467
Colorado & Southern.....	1,099	822,324	163,848	1,108,212	115,115	352,644	43,379	90.40	106,744	41,443	32,352	32,352
Ft. Worth & Denver City.....	456	533,313	161,723	732,653	59,239	194,393	7,949	74.90	183,775	132,193	166,107	166,107
Wichita Valley.....	256	83,799	18,903	109,103	20,517	12,478	42	74.10	28,238	21,095	9,662	9,662
Columbus & Greenville.....	167	99,374	34,368	140,565	27,375	19,062	3,815	82.80	24,220	21,762	11,122	11,122
Delaware & Hudson.....	886	2,718,303	309,731	3,249,516	408,371	1,230,376	40,949	109.40	304,984	390,390	400,837	400,837
Della, Lack. & Western.....	994	4,765,106	1,125,213	6,671,457	545,295	1,999,062	109,085	91.60	558,448	147,097	263,764	263,764
Denver & Rio Grande Western.....	2,593	2,014,921	396,758	2,650,403	292,673	924,973	48,019	94.90	135,772	32,240	21,775	21,775
Denver & Salt Lake.....	255	108,837	14,727	142,959	40,826	75,180	1,011	129.60	42,303	51,303	48,284	48,284
Detroit & Mackinac.....	385	82,304	33,427	125,131	19,084	41,345	1,878	105.90	7,505	18,221	6,171	6,171
Detroit & Toledo Shore Line.....	61	364,116	.....	364,116	26,313	29,111	2,280	47.90	192,915	174,615	80,101	80,101
Detroit, Toledo & Ironton.....	454	742,069	10,867	769,621	75,285	174,401	7,009	77.00	177,225	164,540	69,298	69,298
Duluth & Iron Range.....	279	220,153	22,839	245,550	55,004	130,504	875	205.70	185,135	196,052	194,113	194,113
Duluth, Messabe & Northern.....	305	85,075	20,931	106,006	100,167	197,417	2,862	372.80	362,799	438,756	439,759	439,759
Duluth, South Shore & Atlantic.....	591	310,634	109,581	452,176	40,707	80,096	6,409	88.90	401,854	20,317	10,193	10,193
Duluth, Winnipeg & Pacific.....	178	181,282	25,946	213,473	28,381	27,846	3,415	76.00	51,273	42,863	8,380	8,380
Elgin, Joliet & Eastern.....	459	2,048,360	190	2,048,550	132,437	597,144	12,246	65.50	785,740	710,691	570,232	570,232
El Paso & Southwestern.....	1,039	7,987,125	207,590	8,194,715	1,036,617	1,875,719	29,812	72.60	284,149	208,855	123,436	123,436
Erie.....	2,339	1,050,370	9,632,325	10,682,695	891,423	3,056,343	142,139	93.50	631,236	321,521	344,361	344,361
Chicago & Erie.....	269	908,428	52,106	1,021,472	98,507	180,357	22,216	84.70	156,595	106,933	199,454	199,454
New Jersey & New York.....	135	29,468	91,223	124,892	12,868	27,395	1,284	100.20	105,770	8,633	31,133	31,133
New York, Susq. & Western.....	135	255,080	60,363	325,443	44,366	104,803	3,710	102.80	10,815	44,137	42,858	42,858
Florida East Coast.....	764	106,674	24,798	141,796	22,917	31,748	1,940	60.30	585,737	170,197	466,524	466,524
Ft. Smith & Western.....	249	106,674	24,798	141,796	22,917	31,748	1,940	83.30	23,676	17,856	10,985	10,985
Galveston Wharf.....	13	342,633	102,792	445,425	32,288	2,550	688	87.60	43,552	32,552	30,490	30,490
Georgia.....	328	106,106	18,535	132,222	17,072	16,826	7,742	80.40	25,980	19,581	14,811	14,811
Georgia & Florida.....	405	106,106	18,535	132,222	17,072	16,826	7,742	80.40	25,980	19,581	14,811	14,811

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1923—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Maintenance of way and structures			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals 1922.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equip. ment.	Trans- portation.	Traffic.	General.	Total.				
Grand Trunk Western.....	347	\$1,150,619	\$173,556	\$1,324,175	\$86,444	\$23,337	\$627,061	\$32,698	\$49,382	\$1,120,066	80.40	\$273,676	\$13,282	\$166,756
Atlantic & St. Lawrence.....	166	301,572	32,720	334,292	42,020	56,563	275,844	3,712	8,870	387,127	110.90	38,917	53,347	98,082
Chicago, Det. & Can. Gr. Tr. Jct.....	69	182,407	9,364	191,771	9,721	38,219	82,019	3,866	3,846	117,358	51.90	108,819	101,186	77,084
Det., Gr. Haven & Milwaukee.....	189	346,142	41,267	387,409	42,836	62,050	275,415	9,848	15,344	405,959	93.70	27,329	21,870	17,971
Green Northern.....	8,255	6,887,688	1,201,261	8,088,949	769,387	1,908,830	4,333,916	138,005	207,070	7,099,665	83.50	1,464,995	758,323	917,208
Great Bay & Western.....	234	83,740	15,417	99,157	15,049	23,832	47,659	2,336	3,224	60,147	86.10	14,837	6,837	13,593
Gulf Coast Lines.....	307	705,989	162,332	868,321	155,634	130,394	285,596	27,170	32,896	328,946	85.70	313,991	262,946	192,893
Gulf & Ship Island.....	307	205,749	38,646	244,395	39,810	40,754	78,529	9,390	13,267	182,158	70.50	76,145	51,311	44,433
Gulf, Mobile & Northern.....	433	430,032	38,391	468,423	64,469	77,609	170,777	17,891	15,488	345,167	71.20	139,304	118,527	94,349
Hocking Valley.....	348	1,155,333	92,535	1,247,868	116,000	462,046	463,666	11,677	32,579	1,085,884	83.10	221,575	139,889	178,162
Illinois Central.....	4,839	11,433,272	2,304,993	13,738,265	1,708,488	3,383,510	5,510,871	209,303	320,190	11,145,721	76.20	3,486,138	2,555,869	2,537,742
Yazoo & Miss. Valley.....	1,380	1,492,374	383,312	1,875,686	379,517	375,342	686,708	21,392	42,583	1,495,408	76.20	467,854	356,822	342,182
International & Great Northern.....	1,159	933,683	189,466	1,123,149	229,467	243,067	485,591	28,286	49,177	1,041,295	84.80	186,153	153,650	100,471
Kansas, Okla. & Gulf.....	314	247,425	11,336	258,761	34,645	46,339	101,959	6,778	7,996	200,842	76.30	62,326	52,458	25,457
Kans. City, Mexico & Orient.....	272	89,044	7,386	96,430	28,580	29,115	64,163	5,688	5,066	132,562	128.20	29,195	36,426	30,816
Kans. City, Mex. & O. of Tex.....	465	109,710	8,747	118,457	23,126	27,489	77,007	5,592	5,743	138,957	111.60	14,553	20,636	41,402
Kansas City Southern.....	767	1,488,852	157,534	1,646,386	193,509	368,065	615,077	39,751	65,998	1,282,620	71.90	502,463	417,227	348,980
Lake Terminal.....	81	190,607	13,095	203,702	6,424	13,897	55,899	4,795	7,996	73,513	89.20	110,808	98,439	75,782
Lake Superior & Ishpeming.....	33	8,210	120	8,330	20,758	10,790	12,152	219	3,034	46,953	52.70	8,026	2,076	1,197
Lehigh & Hudson River.....	96	205,786	3,923	209,709	18,724	36,952	96,024	1,632	8,187	161,519	73.40	58,469	46,469	39,835
Lehigh & New England.....	235	450,775	2,296	453,071	38,003	159,007	165,443	7,029	16,700	386,128	83.70	75,270	62,483	60,616
Lehigh Valley.....	1,335	4,151,736	554,075	4,705,811	446,473	2,242,222	2,811,339	95,449	127,088	5,750,892	112.30	627,805	837,007	929,033
Los Angeles & Salt Lake.....	1,137	1,133,612	451,902	1,585,514	281,350	448,012	48,897	48,897	49,166	1,512,480	87.40	217,930	104,734	67,964
Louisiana & Arkansas.....	302	290,567	33,198	323,765	51,725	42,261	95,531	7,669	8,937	203,899	62.30	124,444	100,023	99,374
Louisiana Ry. & Nav.....	343	301,286	32,417	333,703	72,483	60,866	127,447	10,967	11,843	283,227	80.00	70,738	53,344	24,318
Louisville, Henderson & St. Louis.....	5,038	8,324,860	2,106,766	10,431,626	1,345,217	2,782,858	4,351,393	252,075	231,554	8,990,333	81.50	2,042,794	1,591,716	1,726,743
Maine Central.....	1,201	1,048,074	344,389	1,392,463	337,898	301,534	926,064	10,946	46,423	1,622,803	107.00	106,254	204,692	183,997
Midland Valley.....	365	299,753	63,848	363,601	48,594	54,456	125,348	5,252	15,996	253,262	65.80	131,787	116,558	68,573
Minneapolis & St. Louis.....	1,649	1,244,235	138,407	1,382,642	1,468,744	294,401	659,052	42,953	42,953	1,184,971	80.70	283,773	218,256	184,223
Miss., St. Paul & S. S. Marie.....	4,380	3,176,956	660,419	3,837,375	429,386	678,348	1,979,865	50,498	98,675	3,235,817	78.90	866,086	597,561	623,718
Mississippi Central.....	258	136,649	15,942	152,591	17,106	19,426	52,178	5,796	6,730	101,236	64.00	56,980	50,936	52,044
Missouri & North Arkansas.....	364	90,625	19,030	109,655	22,018	13,526	53,275	2,631	5,476	96,976	73.40	14,130	14,130	59,198
Missouri, Kansas & Texas.....	1,670	2,150,199	491,566	2,641,765	287,032	873,081	914,392	50,979	131,227	2,196,080	76.50	673,952	519,312	377,953
Mo., Kans. & Tex. of Tex.....	1,738	1,162,327	400,748	1,563,075	226,634	395,904	775,024	44,794	144,141	1,589,011	92.30	57,285	73,787	177,953
Wichita Falls & Northern.....	329	76,340	16,441	92,781	20,966	23,372	47,147	937	23,727	116,000	118.40	18,058	29,324	46,449
Wichita Falls & Northern.....	7,171	6,530,964	1,533,975	8,064,939	989,932	2,101,334	3,808,124	152,335	4,731	194,579	77.20	1,417,689	1,036,979	599,544
Mobile & Ohio.....	1,165	1,651,369	167,687	1,819,056	197,394	483,323	655,412	46,868	6,862	736,448	75.30	470,830	393,191	329,258
Monongahela.....	106	396,527	39,729	436,256	44,652	99,770	151,803	1,328	9,794	307,347	69.73	133,412	123,462	115,385
Monongahela Connecting.....	7	141,291	493	141,784	22,625	40,385	126,248	590	4,731	194,579	94.90	10,544	9,561	9,619
Montour.....	57	137,851	431,369	569,220	15,655	50,911	36,801	1,125	6,862	111,354	77.20	32,363	29,094	60,801
Nash, Chatt. & St. Louis.....	1,258	1,371,851	431,369	1,803,220	257,441	472,739	816,681	67,572	63,966	1,692,042	87.70	237,081	176,661	231,015
Nevada Northern.....	165	41,052	6,514	47,566	11,267	4,097	10,767	465	3,512	30,106	59.60	20,397	13,795	16,721
Newburg & South Shore.....	7	196,145	29,754	225,899	10,623	56,356	86,426	5,528	4,635	158,040	98.90	1,783	1,783	20,153
New Orleans Great Northern.....	274	161,145	9,911	171,056	26,927	37,723	72,670	1,528	10,549	153,731	81.00	81,475	64,680	65,053
New York Central.....	6,893	22,787,623	8,015,554	30,803,177	3,289,450	9,244,111	13,884,057	271,163	816,681	27,921,066	81.00	6,543,644	4,753,208	3,712,337
New York Central.....	224	412,942	15,117	428,059	50,357	80,103	158,422	3,969	7,443	300,257	69.00	134,915	109,353	80,130
Cincinnati Northern.....	2,409	6,318,286	1,413,307	7,731,593	714,542	1,945,016	3,235,016	103,484	182,330	6,231,581	74.40	2,144,231	1,691,201	1,632,252
Cleveland, Cin., Chic. & St. Louis.....	1,242	3,340,073	133,000	3,473,073	341,707	863,145	1,478,997	83,381	128,758	2,903,060	80.30	710,115	519,761	446,269
Indiana Harbor Belt.....	1,862	5,485,388	1,653,193	7,138,581	1,122,134	2,891,134	4,773,403	61,578	285,948	9,331,618	94.10	579,938	174,810	780,587
Pittsburgh & Lake Erie.....	231	3,168,361	237,651	3,406,012	1,225,522	1,425,522	2,78,494	4,721	10,877	517,812	111.10	2,827	2,827	14,522
New York, Chicago & St. Louis.....	2,000	4,573,284	4,051,412	8,624,696	85,198	1,945,041	1,478,997	15,433	32,916	1,069,055	88.30	804,687	329,037	592,835
New York, New Haven & Hartford.....	2,295	467,211	12,886	480,097	901,839	120,823	648,785	89,862	144,683	6,094,222	88.30	804,687	329,037	592,835
New York, Ontario & Western.....	569	680,081	791,743	1,471,824	909,389	2,198,656	2,737,640	89,862	144,683	6,094,222	88.30	804,687	329,037	592,835
Norfolk & Western.....	2,237	5,812,387	116,996	5,929,383	791,743	1,945,041	1,478,997	15,433	32,916	1,069,055	88.30	804,687	329,037	592,835
Norfolk Southern.....	930	5,527,526	683,637	6,211,163	709,993	1,39,367	3,76,652	157,045	213,871	6,728,920	85.30	1,150,993	475,974	1,021,272
Norfolk Southern.....	6,631	5,958,591	1,253,789	7,212,380	788,013	1,94,615	3,76,652	157,045	213,871	6,728,920	85.30	1,150,993	475,974	1,021,272
Northern Pacific.....	4,496	3,320,899	160,917	3,481,816	139,367	139,367	3,76,652	157,045	213,871	6,728,920	92.20	41,520	7,575	22,442
Northwestern Pacific.....	4,496	3,320,899	160,917	3,481,816	139,367	139,367	3,76,652	157,045	213,871	6,728,920	92.20	41,520	7,575	22,442

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1923—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Equip-ment.	Trans-portion.				
		(Inc. misc.)									
Pennsylvania	10,537	\$37,542,618	\$12,833,054	\$50,375,672	\$4,923,771	\$15,619,954	\$609,648	\$24,325,573	\$1,436,030	\$47,775,794	\$4,941,869
Baltimore, Chesapeake & Atlantic	87	56,740	24,270	81,010	8,169	16,887	1,256	72,221	3,517	102,050	32,188
Long Island	397	845,268	1,272,892	2,318,160	265,936	492,133	16,460	1,249,857	58,762	2,106,246	30,059
Md., Del. & Va.	82	46,312	17,047	63,359	7,196	34,627	807	62,619	2,217	107,466	19,703
West Jersey & Seashore	359	439,764	436,846	876,610	155,193	197,961	11,471	516,056	24,816	919,034	141,846
Peoria & Pekin Union	19	23,114	10,071	33,185	14,460	16,375	436	65,136	9,514	101,407	82,555
Pere Marquette	2,212	2,774,080	404,162	3,178,242	254,411	798,790	50,553	1,453,436	109,931	2,674,509	189,012
Philadelphia & Reading	1,124	7,921,877	889,211	8,811,088	646,368	1,983,863	65,769	3,605,162	143,111	6,463,888	368,690
Atlantic City	176	111,034	118,816	229,850	60,489	31,704	4,909	217,487	4,130	318,655	121
Port Reading	21	266,148	6,132	272,280	4,632	3,747	108	40,677	826	30,012	44,800
Pittsburgh & Shawmut	102	141,639	6,179	147,818	19,814	49,748	2,351	102,529	4,013	131,212	7,681
Pittsburgh & West Virginia	89	225,394	8,731	234,125	22,866	81,684	3,160	80,749	12,817	211,360	54,299
Quincy, Omaha & Kansas City	210	150,733	9,470	160,203	23,478	47,922	2,492	68,409	10,929	153,232	7,818
Richmond, Fred. & Potomac	252	98,644	23,138	121,782	27,553	33,206	795	63,790	1,998	119,104	20,228
Rutland	117	427,129	377,864	805,000	963,696	132,029	11,022	385,009	29,322	654,353	108,311
St. Louis-San Francisco	413	278,446	125,630	404,076	81,364	105,231	7,373	261,221	13,184	470,053	29,237
Ft. Worth & Rio Grande	4,751	4,748,194	1,601,726	6,349,920	679,096	1,291,439	91,801	2,699,204	193,949	4,856,108	1,246,763
St. Louis, San Francisco & Texas	235	84,629	25,900	110,529	22,836	25,482	3,121	57,304	6,588	114,540	34,560
St. Louis, San Francisco & Texas	134	113,593	16,415	130,008	12,840	20,925	3,795	56,682	7,455	110,695	10,847
St. Louis-Southwestern	968	1,727,443	154,179	1,881,622	231,858	368,076	44,684	500,422	54,868	1,206,307	330,926
St. Louis-South. of Tex.	807	579,182	93,665	672,847	136,230	281,278	20,572	481,529	31,131	867,506	191,883
San Antonio & Aransas Pass	739	322,614	61,939	384,553	108,183	126,369	12,331	191,817	25,387	463,739	47,624
San Antonio, Uvalde & Gulf	317	55,040	17,902	72,942	10,261	13,139	4,123	34,195	7,922	69,434	11,581
Seaboard Air Line	3,576	3,049,294	1,065,630	4,114,924	584,833	743,276	139,764	1,849,576	164,401	3,518,775	212,789
Southern	6,971	8,502,473	2,698,564	11,201,037	1,555,350	2,301,625	219,572	4,815,529	315,129	9,292,430	2,156,430
Alabama Gr. Southern	318	690,486	154,190	844,676	90,806	150,898	20,672	312,325	26,116	606,150	81,395
Cin., N. O. & Texas Pacific	338	1,411,014	385,279	1,796,293	204,980	418,450	31,015	607,398	46,658	1,317,806	266,519
Ga., Southern & Fla.	402	266,029	133,714	399,743	62,279	66,421	8,719	188,128	13,072	334,101	44,828
New Orleans & Northeastern	207	471,797	76,551	548,348	74,684	111,955	10,690	226,522	16,575	443,902	104,156
Northern Alabama	110	134,564	12,633	147,197	21,263	24,316	1,285	44,673	2,972	78,509	4,843
Southern Pacific	7,116	9,279,911	3,528,862	12,808,773	2,104,649	2,794,202	272,643	4,960,419	439,814	10,837,447	2,114,268
Arizona Eastern	382	251,449	32,633	284,082	50,513	42,380	2,090	58,012	18,453	172,701	89,144
Atlantic S. S. Lines	1,012	468,523	52,531	521,054	14,230	170,179	18,148	686,389	27,160	916,106	155,794
Galv., Harris, & San Ant.	1,379	1,365,812	417,436	1,783,248	413,698	392,006	46,600	736,900	74,571	1,673,535	122,319
Houston & Tex. Central	923	888,537	260,555	1,149,092	234,537	241,849	25,422	410,857	44,703	953,578	192,068
Houston E. & W. Texas	191	190,111	41,984	232,095	59,068	56,614	3,516	93,725	8,028	218,795	39,529
Louisiana Western	207	313,114	91,002	404,116	67,452	70,964	9,713	108,924	16,771	218,798	118,198
Morgan's La. & Tex. R. R. & S. S.	400	664,416	167,333	831,749	162,019	158,345	16,887	325,843	31,697	699,588	74,831
Texas & New Orleans	507	543,893	150,635	694,528	198,696	174,241	14,022	296,732	24,864	714,596	128,813
Spokane International	165	79,208	16,236	95,444	9,516	9,838	3,144	40,406	5,666	69,410	13,277
Spokane, Portland & Seattle	531	434,698	126,955	561,653	62,637	115,180	9,616	191,232	17,602	406,493	69,635
Tennessee Central	287	185,986	40,739	226,725	239,963	45,237	6,043	98,932	9,359	188,966	35,644
Term. R. R. Assn. of St. Louis	37	.....	.....	.....	402,695	79,318	58,962	134,999	1,991	279,755	199,797
E. St. Louis Connecting	1	.....	.....	.....	202,965	19,157	290	69,120	3,066	106,338	33,842
St. Louis Merchants' Bridge Term.	9	.....	.....	.....	454,274	69,033	938	207,920	6,443	333,673	82,206
St. Louis Transfer	6	.....	.....	.....	72,214	3,931	169	39,576	1,433	53,085	12,373
Texas & Pacific	1,952	1,958,607	613,597	2,572,204	339,427	827,222	54,837	1,100,217	130,649	2,475,357	123,904
Toledo, Peoria & Western	247	98,830	46,154	144,984	27,174	48,133	2,660	88,328	7,571	173,886	40,044
Toledo, St. Louis & Western	454	1,019,912	28,743	1,048,655	96,163	157,677	21,196	380,579	20,173	642,458	138,536
Trinity & Brazos Valley	368	141,216	16,678	157,894	43,138	51,547	4,600	81,347	9,808	161,326	7,581
Ulster & Delaware	128	48,995	21,840	70,835	16,142	27,654	1,736	57,465	7,915	111,375	28,586
Union	45	.....	.....	.....	945,250	44,175	179	488,133	8,052	716,923	151,955
Union Pacific	3,708	6,247,045	1,281,033	7,528,078	636,386	2,134,515	123,692	2,733,310	274,105	6,063,094	1,059,064
Oregon Short Line	2,366	2,497,058	389,850	2,886,908	3,078,198	319,251	662,299	1,096,171	109,605	2,276,003	538,326
Oreg. Wash. R. R. & Nav.	2,237	1,761,186	425,583	2,186,769	354,173	483,890	60,337	1,202,411	124,519	2,245,695	327,001
St. Joseph & Gr. Isl.	258	225,823	24,172	250,000	31,586	47,418	2,465	124,546	12,137	229,740	9,707
Utah	102	148,285	832	149,117	150,327	14,445	332	40,906	5,599	109,240	6,800
Virginian	540	1,446,175	70,764	1,516,939	160,175	390,070	12,999	479,349	35,780	1,099,806	418,660
Wabash	2,472	3,856,675	688,042	4,544,717	1,108,231	1,108,231	113,199	2,057,794	156,945	4,086,530	780,050
Western Maryland	804	1,546,338	75,187	1,621,525	173,907	435,906	35,050	673,515	48,812	1,383,739	264,405
Western Pacific	1,043	699,608	82,602	782,210	125,588	201,786	34,731	386,666	35,464	790,084	65,084
Wheeling & Lake Erie	511	941,293	60,620	1,001,913	1,088,741	86,092	13,355	447,083	34,514	997,596	61,084

The Pennsylvania's Equipment Orders

New equipment ordered by the Pennsylvania to be placed in service this year—some of it already being delivered—involves an expenditure of more than \$57,000,000. In order to handle its share of the country's growing business—normally about 11 per cent. of the freight and 17 per cent. of the passenger traffic of the nation—the company is making large additions to its present car and locomotive capacity.

Since the first of this year, the Pennsylvania has ordered 500 new steam locomotives, for delivery this year in time to be of service when business ordinarily reaches its maximum activity in the fall. In addition to those locomotives, deliveries have been completed on the 100 heavy freight locomotives ordered last August. Final deliveries are now being made on 250 passenger cars ordered last year and 15 passenger locomotives being built at the company's Altoona Works. Three new and improved electrical locomotives and 100 caboose cars are also under construction.

Last fall an order for twenty new all-steel dining cars was completed at Altoona Works. About the same time work was started on an important addition to the company's coal carrying capacity by changing 50-ton trucks to 70-ton trucks under about 10,000 coal cars. This change increases the capacity of these cars by approximately 31 per cent.

The Railway Motor Finance Corporation

The Railway Motor Finance Corporation has been organized under the laws of Illinois, for the purpose of assisting member lines of the American Short Line Railroad Association, and others, in the purchase and operation of railway passenger and express motor cars. Plans have been formulated whereby prospective purchasers of motor cars may finance their needs on a lease purchase basis, paying approximately 25 per cent cash and the balance over a maximum period of four years.

The corporation was organized following the receipt of answers to questionnaires sent to the entire membership of the Short Line Association. Since the total outlay for motor cars by any one road is insufficient to justify a separate car trust, it was necessary to organize a corporation through which the motor car requirements of a large number of lines could be combined. The corporation held its first meeting in Washington on March 3, at which J. W. Cain, manager of purchases, was elected president; L. S. Cass, president of the Waterloo, Cedar Falls & Northern and A. C. Moore, vice-president of the Chicago Railway Equipment Company, were elected vice-presidents and A. M. Fornwald was elected secretary and treasurer. In addition, Bird M. Robinson, president of the American Short Line Railroad Association; Ben B. Cain, vice-president and general counsel, T. F. Whittelsey, secretary and treasurer, and F. J. Lisman were elected directors. The principal office of the corporation will be at 616 Railway Exchange, Chicago, Ill.

January Net 5.54 Per Cent

The Class I railroads of the United States came nearer in January to earning their fair return of 5½ per cent than they had in any preceding month since the passage of the transportation act. The net railway operating income was \$60,544,700, or at the rate of 5.54 per cent on an annual basis. This compares with \$29,486,000, or 2.75 per cent in January, 1922. The highest rate of return heretofore recorded for any month since the law was passed was 5.4 per cent, in October, 1921.

Class I carriers in January reported operating revenues of \$500,683,400. This was an increase of approximately 27 per cent as compared with January last year, although incomplete reports indicate an increase in freight traffic alone compared with the same month in 1922 of nearly 39 per cent. Measured in net ton miles, freight traffic in January was the heaviest for that month in the history of the railroads. Operating expenses for the month amounted to \$407,615,000, or an increase of 21 per cent over January last year and the operating ratio was 81.4 as compared with 85.3 last year. Expenditures for

maintenance of equipment amounted to \$122,721,500, compared with \$93,466,500 during the same month last year.

Railroads in the Eastern district had a net operating income in January of \$24,715,000, which would be at the annual rate of return on their tentative valuation of 5.15 per cent. In January last year, it was \$19,205,000, or 4.10 per cent. In the Southern district the net amounted to \$12,378,800, which would be at the annual rate of return of 7.53 per cent, as compared with 2.86 per cent in January, 1922. In the Western district the net was \$23,560,700, which would be at the annual rate of return of 5.23 per cent, compared with 1.28 per cent in January last year.

Forty-eight railroads in January had operating deficits, of which 25 were in the Eastern, one in the Southern and 22 in the Western districts. In December 42 railroads reported operating deficits.

U. S. Chamber of Commerce to Discuss Transportation

"Transportation in All Its Phases in the United States" and "Europe and Europe's Affairs" will be the two major topics considered at the eleventh annual meeting of the Chamber of Commerce of the United States in New York, May 7 to 10. Transportation will be the keynote of the meeting. Already the National Chamber is engaged in a comprehensive study of the whole problem, hoping to aid in the ultimate formulation of a national transportation policy. That study, however, has been entrusted to a transportation conference created by the chamber and its conclusions will not be available for months in all probability. Special committees of the conference, dealing with specific divisions of the general question, will be in session at the time of the annual meeting and the discussion of transportation subjects at the big meeting in New York naturally divides itself into lines similar to the committee work of the conference.

Representatives of railroads, shipping interests, producers, the motor industry, waterway operators and the public are included in the conference make-up and also will be heard at the annual meeting. The aspects they will discuss include governmental relations to transportation, railroad consolidation, rate schedule readjustments, co-ordination of motor transport and waterway carriers.

In the notice of the meeting Elliot H. Goodwin, resident vice-president of the National Chamber, pointed out that the transportation problem was a purely domestic question which "can and must be solved by American business genius." "No factor in our national life is so universal in its application as the need of adequate means of transporting our goods," Mr. Goodwin said. "Business prosperity—and that means our greatness as a nation—depends on finding the right way to deal with our carriers by rail or water or highway. Concern in this regard is manifest in every department of our national life, in farming, mining, manufacturing, distribution and nowhere more than among railroad executives. There is necessity for adoption of a national transportation policy. Our tonnage is growing; railroad ton-miles have almost trebled in twenty years. What will they be in another twenty?"

"Men of the business world feel there must be a way to harmonize operations of trains and trucks and water carriers to make our transportation system capable of any expansion that our commercial growth demands. But involved in such a project is all the question of planning for national treatment of transportation; insurance of protection for the proper public interest in railroads and at the same time restoration of confidence among investors in the railroads and their management; revision of the railroad rate frame-work so that traffic will not be stifled, yet providing such revenues as will make the carriers living, expanding industrial entities.

"It is not to be expected that a transportation cure-all can be evolved overnight at the coming annual meeting of the National Chamber. It is to be expected, however, that the meeting will foster and stimulate discussion both among business men and the public. Men who are recognized nationally as authorities on transportation will be among the speakers and the annual meeting, while not attempting itself to offer a transportation solution, well may have an important influence in helping to develop national thought on this extremely vital subject."

Traffic News

The Erie announces that, beginning April 1, a day express train will be run each way between New York on the East, and Jamestown and Buffalo on the West. These trains will leave New York at 9 a. m. and arrive at New York at 7:30 p. m.

The International-Great Northern has been awarded damages of \$1,789,000 against the Pierce Oil Company by a federal court at Houston, Tex. The judgment was in support of findings filed September 22, 1922, in a suit involving alleged violations of fuel oil contracts by the oil company.

The Norfolk & Portsmouth Freight Traffic Commission, an organization supported jointly by the merchants and by the city governments, which has been under discussion for some time past, is now being put in operation, and will soon begin its functions, the necessary financial support having been finally agreed upon last week.

The Barge Canal Terminal at Buffalo, N. Y., ought to have railroad track connections to the New York Central railroad, according to the view of the State authorities, and the attorney general of the State has forwarded a complaint to the Interstate Commerce Commission against the railroad company for failure to build the connection. An order for the construction of this trackage, to cost about \$2,000,000, according to present estimates, was issued by the State some time ago.

Nota Bene

E. C. Yellowley, prohibition director, New York City, announces that his field agents, who travel a good deal, have been notified that they are continuously on duty and when violations of the hip-pocket or valise carrying kind are committed in their presence they must place the offenders under arrest regardless of the circumstances of travel. This information is given out in connection with a report that liquor is drunk so freely on trains between New York City and Albany that it has been deemed necessary to conserve the name of the "water level route" in the Prohibition sense.

Getting Down to Particulars

T. M. Henderson, commissioner of the Nashville Traffic Bureau, is mailing out letters to the members requesting that they notify him of any delays to freight for the following causes: Refusal to permit loading of empty car, on siding on account of the so-called home route rule; inability of carrier to furnish cars for loading to certain destinations on account of the so-called home route rule and other cars are available; refusal to permit loading of cars that arrive loaded and are made empty on shipper's track, stating the reason for such refusal; inability of carrier to furnish cars for loading via the L. & N. when N., C. & St. L. cars are available and vice versa; cars placed for loading and after loaded found to be in bad order; refusal to sign bill of lading when car was placed for loading to a specified point, and such point embargoed during the loading or after completion of load.

Shippers' Conference of Greater New York

The annual meeting and dinner of the Shippers' Conference of Greater New York was held on Tuesday evening, March 13, at the Waldorf-Astoria. F. E. Scott, special agent of the Southern Pacific Company, was the principal speaker. C. L. Hilleary, traffic manager of the F. W. Woolworth Company, was elected chairman of the conference for the coming year, and Philip W. Moore, traffic manager of the Queensboro Chamber of Commerce, was re-elected secretary.

A NEW NOTE FOR THE P. T. M. plans have been completed for the reconstruction of the shrine of Ste. Anne de Beaupre, Quebec, which was destroyed by fire last year. It is estimated the new sanctuary will cost over \$1,000,000. It will be larger than the one destroyed.

Commission and Court News

Interstate Commerce Commission

The hearing concerning conditions in New York harbor, which was to have been held by Commissioner Aitchison at the office of the Port Authority, 11 Broadway, New York, on March 15, has been postponed until Thursday, April 5.

State Commissions

During the fiscal year ending June 30, 1922, the Railroad Commission of California issued 1,444 decisions, an average of more than five for every working day. In the same period it held 1,088 hearings and 283 commission meetings and disposed of 4,950 informal complaints.

Personnel of Commissions

C. I. Rhodes, hydraulic engineer of the California Railroad Commission, has resigned.

Supreme Court of the United States

Garnishment Proceedings Against Railroads Under Federal Control Infringe Section 10

The Supreme Court of the United States holds that, under the President's Proclamation taking over the railroads and section 10 of the Federal Control Act exempting the property of the railroads from state process, a resident railroad cannot be garnished for satisfaction of a claim of damages to an interstate shipment against a non-resident railroad not having an office within the state making it subject to state process, though that would be permissible under the state statutes. The bill for attachment was in the Mississippi courts by a lumber company against the Texas & Pacific for damage to a shipment made in October, 1917, and against the Mobile & Ohio, and also against other roads over which the Mississippi courts had no jurisdiction, which roads were indebted to the Texas & Pacific. On a first trial the writ of garnishment was dismissed as to the Mobile & Ohio. This was reversed, on appeal, by the Supreme Court of the state (Dantzler Lumber Co. v. Texas & Pacific, 119 Miss. 328). A second trial and appeal had the same result and the case came before the United States Supreme Court on certiorari. The reason for the state Supreme Court's opinion was that the garnishment proceeding was not "mesne," or intermediate, process, but an original proceeding under the state statute.

The Supreme Court of the United States says, in part: "We think the decision of the Supreme Court is based on a misunderstanding of the Ault case (M. P. v. Ault, 256 U. S. 554). The liability of the Texas & Pacific occurred before the Mobile & Ohio passed under Government control, and while the liability continued and the Texas & Pacific was subject to suit after the assumption of such control, the procedure had to be in accordance with the Acts of Congress, * * * the Mobile & Ohio was made a defendant through garnishment, attempting thereby to defeat the provision of the Federal Control Act, which provides that no process mesne or final shall be levied against any property under such Federal control. And the prohibition was necessary to the unity and effectiveness of [Federal] control * * *. Such is the ruling in the Ault case, where also it was decided that 'levy or execution upon their property was precluded as inconsistent with the Government's needs.' 'Thus, under Sec. 10,' is the declaration, 'if the cause of action arose prior to Government control, suit might be instituted or continued as though there had been no taking over by the Government * * *'

"To repeat, the right of suit against the carriers was decided, but there was also decided the exemption of their property from levy or execution. The garnishment proceeding against the Mobile & Ohio was an infraction of the exemption. It is not excluded from the condemnation because it is a procedure under the statutes of the State."—Davis v. Dantzler Lumber Co. Decided February 26, 1923. Opinion by Justice McKenna.

Foreign Railway News

German-Polish Railway Transit Agreement

According to Commerce Reports, effective February 1, 1923, freight shipments may be made by rail via Poland between Germany on the one hand and Rumania, Austria, Hungary and Czechoslovakia on the other, using a through bill of lading, according to an agreement by representatives of the countries involved. Coal moving from Upper Silesia through Germany via Passau to Poland, Czechoslovakia, Austria and Hungary may now be delivered in those countries on payment of charges, where heretofore prepayment has been necessary. For other goods prepayment is still demanded.

French to Supply New Equipment for Siamese Railways

A French company has obtained the contract for 10 new locomotives for the Siamese State Railways, on the basis of the lowest tender in competition with American, British, Belgian, and German concerns, according to Consul Brodie at Bangkok. The total amount budgeted being considerably in excess of the French tender, a portion of the surplus over and above the price quoted was diverted to the purchase of 4 additional locomotives, 2 from an American company, and 2 from a British concern. At the present time only British and German locomotives are in use on the Siamese State Railways, and the new contracts mark the introduction into Siam of the first American railway equipment of this character.

American exporters are at some disadvantage in obtaining orders for heavy railway equipment in Siam in competition with British and Continental European firms. The greater distance involved necessitates a heavier freight charge on American-made products. As there is no direct steamer service between United States ports and Bangkok, freight originating in the United States and consigned to Bangkok must be transshipped either at Hongkong or Singapore. Furthermore, the unfavorable exchange rate is another feature that affects adversely the Siamese market for American products. The difference between the buying and the selling rates in conversion of American money into ticals, or vice versa, is about 3 cents, whereas the difference in buying and selling sterling is only one-half cent.

Mexicans Urge Completion of Durango-Mazatlan

Petitions by the various chambers of commerce and land owners of the states of Sinaloa and Durango have recently been presented to President Alvaro Obregon urging him to bring the matter of making an appropriation for completing the line of the National Railways of Mexico between the city of Durango and Mazatlan before Congress at the earliest possible time. It is pointed out in these petitions that the gap remaining to be filled between the two cities is only about 60 miles. That part of the road which runs from Durango to Llano Grande was built before the outbreak of the revolution more than twelve years ago. It has since been extended several miles into the heart of a vast tract of pine timber and to a point that overlooks the Pacific slope, 7,000 feet below.

The feat of getting down the heights of the Sierra Madres to sea level within so short a distance is one that confronts engineers and contractors. When the late Collis P. Huntington, then president of the Southern Pacific, built the Mexican International Railroad from Eagle Pass, Tex., to Durango, he had in view the continuation of the line to the Pacific port of Mazatlan. His engineers spent several years making surveys for the proposed extension. They reported that there was no available route from the heights of the mountains to the coastal country below and the project was finally abandoned. Since then engineers of the Mexican government have made other surveys, with the result that they claim to have found a feasible route. It is stated, however, that the cost of construction would be heavy, and it is doubted if the government at this time is in financial condition to undertake the project. Completing the line to Mazatlan would give central and a big scope of northern Mexico a direct route to the Pacific.

Equipment and Supplies

Locomotives

THE PHILADELPHIA ELECTRIC has ordered one locomotive from the Baldwin Locomotive Works.

THE LITCHFIELD & MADISON has ordered three locomotives from the American Locomotive Company.

THE DETROIT EDISON COMPANY has ordered one 0-6-0 type locomotive from the Baldwin Locomotive Works.

THE SIBOOMOOK LAKE & ST. JOHN ordered one Prairie type locomotive from the Baldwin Locomotive Works.

THE WISCONSIN & ARKANSAS has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE CHICAGO, WILMINGTON & FRANKLIN COAL COMPANY, Chicago, has ordered one 0-6-0 type locomotive from the Baldwin Locomotive Works.

THE ANN ARBOR has ordered 5 heavy Mikado type locomotives from the American Locomotive Company. This road was previously reported in the *Railway Age* of March 3 as having ordered 3 Mikado type locomotives.

Freight Cars

THE HOOKER ELECTROCHEMICAL COMPANY is inquiring for five tank cars.

THE STUDEBAKER CORPORATION is inquiring for six flat-bottom gondola cars.

THE BALTIMORE & OHIO is inquiring for bids on new car bodies or rebuilding 1,000 coke cars.

THE TOLEDO, ST. LOUIS & WESTERN is inquiring for 100 flat cars of 50 tons' capacity.

THE OLIVER CHILLED PLOW WORKS, South Bend, Ind., is inquiring for one hopper coal car.

THE SKELLY OIL COMPANY has ordered 50, 8,000 gal. capacity tank cars from the Standard Tank Car Company.

THE CHICAGO & NORTH WESTERN has ordered 40, 10,000 gal. capacity tank cars from the American Car & Foundry Company.

THE CARNEGIE STEEL COMPANY is inquiring for 20 gondola cars of 50 tons' capacity and 20 gondola cars of 70 tons' capacity.

THE MIDLAND REFINING COMPANY has ordered 100, 50-ton, 10,000 gal. capacity tank cars from the Standard Tank Car Company.

THE UNIVERSAL PORTLAND CEMENT COMPANY, reported in the *Railway Age* of January 13 as inquiring for 300 box cars, has ordered 300 all-steel box cars from the American Car & Foundry Company.

THE FRUIT GROWERS EXPRESS, reported in the *Railway Age* of March 3 as inquiring for 2,000 steel underframes for refrigerator cars, has ordered 1,000 steel underframes from the Pressed Steel Car Company. It is reported that 1,000 steel underframes have also been placed with the Keith Car & Manufacturing Company.

Passenger Cars

THE MISSOURI PACIFIC is inquiring for 10 baggage cars and five mail storage cars.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of February 24 as contemplating buying 50 cars for passenger service, is now inquiring for 10 combination baggage and mail cars, 10 coaches, 5 middle room smoking coaches, 14 baggage cars, all

the above to be 70 ft. long; also inquiring for 5 coaches, 61 ft. long, 5 middle room smoking coaches, 61 ft. long, and 2 dining cars.

Iron and Steel

THE CHICAGO & NORTH WESTERN has ordered 3,000 tons of structural steel for bridge renewals from the American Bridge Company.

Track Specialties

THE LONG ISLAND will receive bids until 10 o'clock a. m. March 29, for 29 frogs—hard, 44 switches, 600 kegs iron track spikes, 11,000 track bolts, 25,000 galvanized lag screws and 38,000 galvanized carriage bolts.

Machinery and Tools

THE LOUISVILLE & NASHVILLE has ordered one, 20-ton locomotive crane from the Browning Company.

THE PERE MARQUETTE has ordered one 200-ton, five 15-ton and two 10-ton electric traveling cranes for use in its shops at Grand Rapids, Mich., from the Shaw Crane Company.

Miscellaneous

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon March 28, for its requirements until July 1, 1923, for the line east and west of Buffalo, of fuel oil (paraffine base), gasoline, kerosene, long time burning semaphore oil, turpentine substitute, coach candles, mineral seal oil, common black oil, West Virginia black oil, gas oil and lubricating oil.

Signaling

THE GRAND TRUNK has ordered from the General Railway Signal Company, semaphore signals, model 2A, and other material, for automatic block signalling between Yarmouth, Me., and Portland, 12 miles, double track; together with low-voltage switch machines for the remote operation of five switches with desk circuit controllers; also an electric interlocking plant for installation at the crossing of the Michigan Central at Charlotte, Mich.; model 2, unit lever machine, 28 spaces. Complete detector, route and approach locking will be installed.

Trade Publications

WATER TREATMENT.—The Graver Corporation, East Chicago, Ind., has issued an eight page booklet describing the chemistry of the zeolitic process of water softening in general and the Graver process in particular. The booklet devotes some attention to the adaptability of this form of treatment to purification of water containing scale forming materials and contains sectional views of the equipment provided for using it.

SAND DRYERS.—The Roberts & Schaefer Company, Chicago, has issued a bulletin illustrating and describing a newly developed coal burning sand dryer for use in preparing sand for use on locomotives. This stove is represented as an improvement over existing equipment. It is illustrated in the bulletin with both line drawings and photographs, the photographs showing the stove complete and with the sand hopper removed. The bulletin also illustrates and briefly describes the Beamer patent steam sand dryer.

NATIONAL MATHEWSON JOINT PIPE.—The National Tube Company, Pittsburgh, Pa., has recently issued a large size, 64-page, well illustrated booklet descriptive of Mathewson joint pipe manufactured by this company. The text and illustrations give a full discussion of the design and construction of all forms of pipes using this form of joint as well as installation details. In the latter part of the booklet is given data relative to the flow of water in pipes and covering such subjects as loss of head at entrance, loss of head through friction, obstruction, bends, etc.

Supply Trade News

Joseph T. Ryerson & Son, Chicago, have taken over the Cincinnati Iron and Steel Company, Cincinnati, O.

F. L. Pierce, treasurer of the Cutler-Hammer Manufacturing Company, Milwaukee, has been elected first vice-president and treasurer.

The Kirby-Bonner Lumber Company, Houston, Texas, has removed its eastern sales offices from 120 Broadway to room 2612 Grand Central Terminal, New York City.

A. W. Berghoefer has again become associated with the Gifford-Wood Company, Hudson, N. Y., and will be located at the company's New York City office, 50 Church street.

F. H. Maloney, commercial agent of the Mississippi Warior Service, with headquarters at Chicago, has been appointed general agent, of the railroad department of the Truscon Steel Company, with headquarters at St. Louis, Mo.

A. A. Taylor, manager of the railroad division of Fairbanks, Morse & Company, with headquarters at Chicago, has resigned to become vice-president and general manager of the



A. A. Taylor

Locomotive Firebox Company, manufacturer of Nicholson thermic syphon, with the same headquarters. Mr. Taylor was born at Yates City, Ill., on December 3, 1869, and entered railway service in the office of the vice-president of the Chicago, Burlington & Quincy, at Chicago, in 1887. In 1889, he entered the employ of Westinghouse, Church, Kerr & Company, Chicago, in the stoker department, where he remained until 1891, when he entered the sales department of the Morden Frog & Crossing Company, Chicago.

From 1896 to 1899, he was employed by the Cable Piano Company, Chicago, and on February 1, 1899, he entered the employ of Fairbanks, Morse & Company, Chicago, as a salesman in the railroad department in the territory east of the Mississippi river and south of the Ohio river. In 1906, he was promoted to manager of that part of the railroad department operating from Chicago, with headquarters at Chicago. In September, 1915, he was promoted to manager of the railroad division including the construction department, in charge of all railroad business in the United States and foreign countries, which position he held up to the time of his resignation. Mr. Taylor has been active in railway supply association work, having served as a director of the National Railway Appliances Association for the last three years.

Hunter Michaels, advertising manager of the Union Metal Products Company, with headquarters at Chicago, has been appointed sales agent of the Railway Steel Spring Company with the same headquarters, succeeding D. B. Fulton, resigned.

Harry S. C. Folk and Donald Weaver have joined the railway department of the Electric Storage Battery Company as assistants to Howard S. Mills of the New York City office. Mr. Folk was previously in charge of the industrial truck and locomotive department and Mr. Weaver was formerly connected with the general office staff in Philadelphia, Pa.

The Charter Gas Engine Company, Sterling, Ill., has bought the entire Mietz oil engine (also known as Mietz and Weiss)

business, heretofore carried on in New York City by the August Metz Corporation and the Reliance Oil Engine Corporation.

Chicago Pneumatic Tool Company

The report of the Chicago Pneumatic Tool Company for the year ended December 31, 1922, shows net income of \$505,818 after all charges and federal taxes, equivalent to \$4.44 a share earned on \$11,381,900 outstanding capital stock. This compares with \$118,364, or 93 cents a share on \$12,309,000 stock in 1921.

The general balance sheet on December 31, 1922, showed net current assets of \$9,496,106 and net current liabilities of \$1,956,697. Of the current assets, \$7,223,345 consisted of raw materials and finished products and \$756,701 cash on hand. Accounts and notes receivable totaled \$1,512,357. Notes payable totaled \$1,295,000 and accounts payable \$546,644.

H. A. Jackson, president, in his statement to the stockholders said:

"Although this company during the early part of the year suffered severely from the general business depression, the very decided improvement over the latter portion of the year enabled it to meet its dividend requirements and carry a slight excess to surplus. The great improvement in industrial conditions has materially increased the volume of sales, reduced the cost of operation and forecasts favorable results for the coming year."

American Steel Foundries

The net income of the American Steel Foundries for 1922 after all deductions and charges excepting sinking funds, was \$3,709,866, as compared with \$356,863 in 1921. This was equal, after allowance for preferred dividends, to \$5.10 a share earned on the \$20,401,000 of common stock outstanding, compared with nothing earned on the common stock the previous year. The common stock outstanding amounts to \$24,073,200. An 18 per cent stock dividend was paid late in the year. The statement as of December 31, 1922, shows \$340,800 bonded debts, which have since been paid off. The company now has no securities ahead of its stock.

The income account for 1922 and the balance sheet as of December 31, 1922, are as follows:

INCOME ACCOUNT		
	1922	1921
Gross sales	\$38,171,148	.....
Expenses	33,689,307	.....
Depreciation	945,625	\$512,736
Operating income	3,536,214	915,453
Other income	552,678	325,885
Total income	4,088,892	1,241,339
Tax reserve .....	.....	126,026
Interest	71,420	156,042
Bond sinking fund on debentures	\$340,311	318,146
Due minority interest in subsidiary companies	379,026	284,262
Net income	3,709,866	356,863
Preferred dividends	586,691	593,691
Preferred sinking fund	485,510	100,780
Balance	2,697,354	†337,609
Common dividends	1,836,090	1,836,090
Surplus	860,264	†2,173,698
Earned on common	\$5.10	.....

*Deficit. †Not deducted before net income in 1922.

BALANCE SHEET		
Assets:		
Real estate plant, equipment, tools, patents, good will, less depreciation	\$32,623,440	\$33,276,843
Sinking fund	172,103	85,593
Deferred charges	81,696	123,809
Liberty bonds, certificates of indebtedness	2,757,567	4,975,178
Miscellaneous securities	451,366	374,051
Inventories	6,721,238	5,458,903
Accounts and bills receivable	7,841,196	5,118,215
Cash	1,080,176	962,155
Total assets	\$51,728,794	\$50,374,748
Liabilities:		
Preferred stock	\$8,381,300	\$8,381,300
Common stock	24,073,200	20,401,000
Capital stock of subsidiaries not held by American Foundries and surplus	4,661,413	4,733,336
Bonded debt	340,800	340,800
Reserves	453,073	470,175
Appropriated surplus	68,785	3,314,144
Profit and loss surplus	9,831,295	8,971,033
Notes payable .....	.....	500,000
Accounts payable	1,833,251	1,252,222
Payroll accrued	430,978	276,215
Interest accrued	5,680	5,680
Res. war. excess profit, income, other tax	1,189,993	1,269,821
Dividends payable	459,022	459,023
Total liabilities	\$51,728,794	\$50,374,748

G. W. Wagner, general purchasing agent of the Detroit United Railway, has entered the employ of the I. M. Jacobson & Sons Company, and has been placed in charge of the steam and electric railway sales division with headquarters at Detroit, Mich.

Stanley H. Smith, who was formerly sales agent for the Pennsylvania Steel Company in Chicago and Cleveland and sales agent of the Bethlehem Steel Company in Cleveland has recently opened a shovel warehouse for The Wyoming Shovel Works at 422 Frankfort avenue, Cleveland, Ohio, where he also represents Harrisburg Pipe & Pipe Bending Company, The National Lock Washer Company and The Stevens Metal Products Company.

Work has been started on a 23-story bank and office building at 150 Broadway, New York City, which will be known as Westinghouse building. All of the space above the eleventh floor will be leased and occupied by the Westinghouse Electric & Manufacturing Company, together with the Westinghouse Electric International Company, the Westinghouse Lamp Company, the Westinghouse Air Brake Company and other allied organizations.

The Q. & C. Company, New York, have taken over the exclusive sales for the Interstate one-piece guard rail formerly manufactured and sold by the Interstate Railway Supply Company, Cleveland, Ohio. This device will be known as the Q. & C. Interstate one-piece guard rail. This company has also been appointed sole selling agent for the Trench-Zepp stone ballast cleaner, made by Littleford Brothers, Cincinnati, Ohio. The device will be known as the Q. & C. Zepp stone ballast cleaner.

Obituary

W. E. Brumble, manager of the Southeastern territory of the Nathan Manufacturing Company, New York, died at his home in Baltimore, Md., on March 2.



W. E. Brumble

Mr. Brumble was born at Renovo, Pa., on April 8, 1871. He began railway work as a messenger for the Northern Central in March, 1885, and subsequently served consecutively as yard clerk and fireman. In May, 1894, he was appointed an engineman on the Norfolk & Western and in October, 1901, he entered the services of the Seaboard Air Line as road foreman of engines. He was later promoted to trainmaster of the first division with headquarters at Richmond, Va. From October, 1903, until October, 1916, he was with

the Galena Signal Oil Company at Richmond, as mechanical expert, leaving that company to enter the services of the Nathan Manufacturing Company as manager of its Southeastern territory, the position he held at the time of his death.

Edwin Henry Benners, an inventor of railway appliances and formerly a manufacturer of lubricating oils, died on March 9 at the Elizabeth, N. J., General Hospital, at the age of 60. About 35 years ago he went to Elizabeth, N. J., where he established the E. H. Benners Lubricating Company. Later he organized the Crown Castings Company, with offices in New York.

E. T. Whiter, acting vice-president of the Northwestern region of the Pennsylvania will speak before the Western Railway Club at its regular monthly meeting to be held at the Auditorium hotel, Chicago, on Monday, March 19.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company contemplates the construction of a new passenger station at Cushing, Okla.

BALTIMORE & OHIO.—This company, which was reported in the *Railway Age* of February 24 as calling for bids for the construction of a water treating plant of 25,000 gal. per hour capacity and for alterations to the existing pipe lines at Ivorydale, Ohio, has awarded the contract to Joseph E. Nelson & Sons, Chicago.

BUFFALO, ROCHESTER & PITTSBURGH.—This company has awarded a contract to the American Bridge Company for strengthening 17 steel bridges between Punxsutawney, Pa., and Echo to permit the operation of heavier power.

CHICAGO, BURLINGTON & QUINCY.—This company is receiving bids for a five-stall addition to its roundhouse at Eola, Ill., and a seven-stall addition to its roundhouse at Aurora, Ill.

CHICAGO, ROCK ISLAND AND PACIFIC.—This company has awarded a contract to the J. A. Benson Construction Company, Des Moines, Iowa, for the construction of a 13-stall roundhouse at Valley Junction, Iowa, reported in the *Railway Age* of March 3.

CHICAGO UNION STATION.—This company has awarded a contract for the foundation of the Metropolitan elevated structure, Chicago, to the Underground Construction Company.

ELGIN, JOLIET & EASTERN.—This company is receiving bids for a 20-stall roundhouse at Gary, Ind.

ERIE.—This company is completing extensive repairs to its passenger station at Jersey City, N. J. The work includes raising the level and paving the floor of the station and platforms and the installation of new platform gates and train indicators.

ILLINOIS CENTRAL.—This company has asked for bids for the construction of a retaining wall on the west side of this property between Twenty-eighth and Forty-first streets, Chicago, for retaining walls on the east side of the tracks north of Roosevelt road, for the excavation and miscellaneous work on the west side of its property south of Randolph street and for the protection of a large sewer at Thirty-ninth street.

ILLINOIS CENTRAL.—This company will construct a one-story brick passenger station at Anna, Ill.

KANSAS CITY SOUTHERN.—This company closed bids March 14 for the construction of a one-story brick passenger station, 186 ft. by 24 ft., at De Quincy, La.

LONG ISLAND.—This company is preparing plans for a new station at Bayside, Long Island.

MISSOURI, KANSAS & TEXAS.—This company closed bids on March 10 for a four-story ice house and plant at Denison, Texas, the building to be 40 ft. by 40 ft. with a platform 800 ft. by 16 ft.

PACIFIC ELECTRIC.—This company has been granted permission by the Railroad Commission of California to construct, jointly with the Southern Pacific, a bridge over the Santa Ana river at El Moro, Cal.

ST. LOUIS-SAN FRANCISCO.—This company plans the construction of a new freight and passenger station at Bristow, Okla., to cost approximately \$30,000.

SOUTHERN NEW ENGLAND.—This company, a subsidiary of the Central Vermont, will take immediate steps to complete its partly built line from Palmer, Mass., to Providence, R. I., 83 miles, if the Rhode Island legislature will extend for two years its franchise according to press dispatches from Providence. A considerable part of the line was graded in 1910-1912.

WYOMING.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension of 125 miles from Buffalo to Casper, Wyo.

Railway Financial News

CHICAGO & ALTON—Ordered to Pay Interest.—This company has been ordered by Judge Carpenter in the federal court at Chicago to pay \$675,000 interest due since October 1, 1922, on a first mortgage of \$45,000,000 deposited with the Illinois Trust and Savings Bank of Chicago. The preferred and common stockholders committee asked that earnings be impounded to secure the payment of interest due on a second mortgage of \$22,000,000, which interest was due on January 1 and is unpaid. The receivers said the road has made money over and above operating expenses during the last few months, but they were unable to pay the interest on both mortgages now.

CINCINNATI, INDIANAPOLIS & WESTERN.—Equipment Trust Authorized.—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of \$300,000 of 6 per cent cumulative preferred stock of the Cincinnati, Indianapolis & Western Car Equipment Company.

GREAT NORTHERN.—Asks Authority to Issue Bonds.—This company has applied to the Interstate Commerce Commission for authority to have authenticated and delivered to its treasury \$60,000,000 of general mortgage 5 per cent gold bonds, dated January 1, 1923, to January 1, 1973, to reimburse the treasury for expenditures, including the discharge of a government loan of \$2,910,000. Authority is also asked to sell \$20,000,000 of the bonds immediately.

GULF, MOBILE & NORTHERN.—Asks Authority to Acquire Control.—This company and the Meridian & Memphis have filed a joint application with the Interstate Commerce Commission for authority for the acquisition of control of the Meridian & Memphis by the Gulf, Mobile & Northern.

ILLINOIS CENTRAL.—Asks Authority to Issue Bonds.—This company, the Chicago, St. Louis & New Orleans and the Canton, Aberdeen & Nashville have filed a joint application with the Interstate Commerce Commission for authority to issue \$2,168,900 of the I. C. and C., St. L. & N. O., joint first and refunding mortgage 5 per cent bonds to reimburse the treasury of the Illinois Central for advance for additions and betterments.

INTERNATIONAL-GREAT NORTHERN.—Purchase Approved.—See St. Louis-San Francisco.

INTERSTATE.—Asks Authority to Issue Stock.—This company has applied to the Interstate Commerce Commission for authority to issue \$875,000 of capital stock to be sold at par and the proceeds applied to purchase of 500 steel hopper cars.

LOUISVILLE & NASHVILLE.—Asks Authority to Acquire Control.—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Black Mountain Railway and to operate it under lease.

MERIDIAN & MEMPHIS.—Acquisition of Control.—See Gulf, Mobile & Northern.

MARIETTA & VINCENT.—Authorized to Abandon Line.—The Interstate Commerce Commission has issued a certificate authorizing the abandonment as to interstate and foreign commerce of this company's line from Moore's Junction to Vincent, Ohio, approximately 10 miles.

NEW YORK, CHICAGO & ST. LOUIS.—Merger Approved.—The stockholders at a special meeting in Cleveland on March 13 ratified the proposed consolidation with the Toledo, St. Louis & Western and the Lake Erie & Western.

PENNSYLVANIA.—Equipment Trust Certificates Sold.—Kuhn, Loeb & Co. have sold \$31,500,000 equipment trust 5 per cent certificates, maturing in equal annual instalments from March 1, 1924, to March 1, 1938, inclusive, at 99½ and dividends, at which price the average yield will be about 5.08 per cent. The issuance and sale of the certificates is subject to the approval of the I. C. C. The certificates are to be secured by standard railroad equip-

ment, comprising 250 steel passenger cars and 475 heavy freight locomotives and tenders of a total cost of at least \$39,375,000. They will be issued by the Fidelity Trust Company of Philadelphia, as trustee, and the principal of the certificates and dividends will be unconditionally guaranteed by indorsement by the Pennsylvania Railroad Company.

READING COMPANY.—*Objection to Segregation Plan.*—The Central Union Trust Company of New York, trustee under the general mortgage of the Reading Company, has filed objections to the second modified plan for segregating the railroad and coal properties. It asserts that the plan is drawn in the interest of the Reading Company and its stockholders, while making no adequate provision for financial loss entailed by the bondholders. The trustee declares its sole object to be that bondholders receive an equivalent for that which they are required to surrender. It is asserted also that, by reason of apportionment of the debt and the security therefor, the bonds have lost in security not only the increased earning power due to joint control, but also the joint guaranty of each company for the whole issue and the diversified security pledged therefor. The suggestion was made by the trust company that the court order cancellation of the general mortgage and payment of its amount, \$94,627,000 with accrued interest, to the general mortgage bondholders.

SOUTHERN.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of \$6,750,000 of 5 per cent equipment trust certificates sold to Drexel & Co. at 97.

SOUTHERN RAILWAY.—*2½ Per Cent Preferred Dividend.*—This company has declared a semi-annual dividend of 2½ per cent on the preferred stock, payable April 20 to stock of record March 29. Only one 2½ per cent dividend was paid in 1922 (November 15) instead of the 5 per cent annually paid previously. The declaration at this time means that the preferred is again on a 5 per cent annual basis and that payment dates are to be the same as before federal control.

ST. LOUIS-SAN FRANCISCO.—*Purchase of International-Great Northern.*—The purchase of the International-Great Northern was approved by a special meeting of stockholders of the St. Louis-San Francisco on March 7. Stockholders of the International-Great Northern previously gave their consent to the consolidation of the roads and the only remaining requirement is the approval of the Interstate Commerce Commission.

UNION PACIFIC.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability for an issue of \$5,687,000 of 4½ per cent equipment trust certificates.

WESTERN PACIFIC.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for the issue of \$5,600,000 of 5½ per cent equipment trust certificates proposed to be sold to Blair & Co., and E. H. Rollins & Co., at 97¼.

Dividends Declared

El Paso & Southwestern.—\$1.50, quarterly, payable April 2 to holders of record March 28.

Joliet & Chicago.—\$1.75, quarterly, payable April 2 to holders of record March 20.

Lehigh Valley.—Common, 1¼ per cent, quarterly; preferred, 2½ per cent, quarterly; both payable April 2 to holders of record March 17.

Pittsburgh, Bessemer & Lake Erie.—Common, 1¼ per cent, semi-annually, payable April 1 to holders of record March 15.

Southern Railway.—Preferred, 2½ per cent, semi-annually, payable April 20 to holders of record March 29.

Bangor & Aroostook.—Preferred, 1¼ per cent, quarterly, payable April 1 to holders of record March 15.

Minneapolis, St. Paul & Sault Ste. Marie Leased Line.—\$2.00, semi-annually, payable April 1 to holders of record March 20.

Trend of Railway Stock and Bond Prices

	Mar. 13	Last Week	Last Year
Average price of 20 representative railway stocks	68.83	69.41	61.45
Average price of 20 representative railway bonds	83.19	84.05	82.50

Railway Officers

Executive

R. E. McCarty, whose appointment as assistant to the vice-president in charge of the Central region of the Pennsylvania



R. E. McCarty

was announced in the *Railway Age* of March 3, page 543, was born on April 25, 1862, at Leavittsville, Ohio, and was educated in the common schools of Carrollton, Ohio. He entered railway service in July, 1879, as a telegraph operator at Bow-erston, Ohio, on the Pittsburgh division of the Pittsburgh, Cincinnati, Chicago & St. Louis. In 1882 he was promoted to train dispatcher and served in that capacity until 1895 when he was advanced to assistant train master. The following year he was appointed trainmaster and in 1902 he became superintendent of the Pittsburgh division. In April, 1905, he was appointed general superintendent and in 1917 was named resident vice-president at Detroit, Mich. For a short time in 1918 he was transportation assistant on the same road. He was then advanced to general manager of the Pennsylvania at Pittsburgh and later to the position of general manager of the company's Central region with the same headquarters.

J. T. Loree, whose appointment as vice-president of the Delaware & Hudson was announced in the *Railway Age* of March 10, page 591, was born on April 6, 1888, at Logansport,



J. T. Loree

Ind. He was graduated from Yale University in 1909 and entered railway service as chief traveling auditor of the Kansas City Southern in the same year. From May, 1910, to September of the same year he served in the signal department of the Pennsylvania. From the latter date to February, 1911, he held various positions in the engineering department of the Southern Pacific. In June of the same year he went to the Delaware & Hudson as a draftsman and a few months later was sent to England on a special mission to study English railroad practice. He was then appointed assistant division engineer on the Southern Pacific and served in that capacity until 1912 when he went with the Pennsylvania as trainmaster's clerk and assistant trainmaster. In July, 1913, he was appointed assistant trainmaster in charge of the Carbondale, Pa., terminal of the Delaware & Hudson. In February, 1914, he was promoted to trainmaster of the Susquehanna division and in June of the same year to superintendent of that division. In February, 1915, he became assistant to the superintendent of transportation. In January, 1917, he was promoted to general manager with headquarters at Albany. Shortly after America's en-

trance into the war he joined the army as assistant division quartermaster of the 27th division with the rank of major and rose to the rank of colonel and to provost-marshal deputy general. From July, 1919, to March, 1920, he was chief of staff of the American section of the Interallied Military Commission to Hungary and Deputy United States Commissioner. In March, 1920, he returned to the Delaware & Hudson as general manager and served in that capacity until the time of his recent appointment.

Operating

W. R. Davidson, whose appointment as general superintendent of the Montreal district of the Central region of the Canadian National was announced in the *Railway Age* of



W. R. Davidson

March 10, page 592, was born on November 8, 1871, at Everton, Mo. After being graduated from college he entered railway service as a telegraph operator on the Missouri Pacific in January, 1890. Subsequently, he served the same road consecutively as train dispatcher, chief dispatcher and trainmaster. In March, 1911, he went with the Grand Trunk as a trainmaster and was subsequently promoted to superintendent and then to general superintendent of the Western lines. Later he was transferred in a similar

capacity to the Eastern lines, with headquarters at Montreal, and served in that capacity until the consolidation of the Grand Trunk with the Canadian National.

C. G. Bowker, whose appointment as general manager of the Central region of the Canadian National with headquarters at Toronto was announced in the *Railway Age* of March 10,



C. G. Bowker

page 592, was born on April 21, 1871, at Medford, N. J. He was educated in the public schools of Philadelphia and entered railway service in May, 1888, as a telegraph operator for the Philadelphia & Reading. Subsequently he served the same company as agent and division operator. In 1892 he entered the service of the Lehigh Valley as a telegraph operator and was later promoted to train dispatcher. In 1900 he went to the Grand Trunk as a train dispatcher and was subsequently promoted to

chief dispatcher, trainmaster, assistant superintendent and superintendent. In February, 1913, he was advanced to general superintendent of the Eastern lines. In May, 1918, he was advanced to general superintendent of the Ontario lines and thereafter to operating manager of the Eastern lines, in which capacity he served until the consolidation of the Grand Trunk with the Canadian National.

G. A. Brown, superintendent of car service of the Chicago Great Western, with headquarters at Chicago, has been appointed special representative on the staff of the vice-president

of the Chicago, Indianapolis & Louisville, with the same headquarters.

M. W. Clement, whose appointment as general manager of the Central region of the Pennsylvania with headquarters at Pittsburgh was announced in the *Railway Age* of March 3,



M. W. Clement

page 543, was born at Sunbury, Pa., and was educated at Trinity College. He entered railway service in 1901 in the engineering department of the Pennsylvania. In March, 1905, he was advanced to assistant supervisor and thereafter to supervisor. In December, 1914, he was promoted to division engineer and served in that capacity until June, 1917, when he was advanced to division superintendent. In September of the following year he was promoted to superintendent of freight transportation and in June,

1919, became superintendent of passenger transportation. In March, 1920, Mr. Clement was promoted to general superintendent with headquarters at Cleveland and served in that capacity until the time of his recent promotion.

C. B. Brown, engineering assistant to the vice-president of the Canadian National, has been appointed chief engineer of the operating department. He was born on August 27,



C. B. Brown

1879, at Ithaca, N. Y., and was graduated from Cornell University in 1901. He entered railway service in the same year as a draftsman for the Canadian Pacific. A short time thereafter he became rodman and then assistant engineer of the bridge department of the same road. From 1902 to 1904 he was resident engineer on the Ontario division. From 1904 to 1906 he was assistant division engineer at Calgary, Alta. From 1906 to 1908 he was division engineer at St. John, N. B. He was then transferred to Montreal in

the same capacity and in 1912 was promoted to principal assistant engineer of the company's Eastern lines. From 1913 to 1917 he was chief engineer of the Canadian Government Railways at Moncton, N. B. In 1917 he was promoted to assistant general manager of the company's Eastern lines and chief engineer of all lines. In 1918 he was appointed chief engineer of the Canadian National, Eastern lines, which included what was formerly known as the Canadian Government Railways. In 1920 he was advanced to engineering assistant to the vice-president and in this position he served at the time of his recent appointment.

A. R. Ayers, whose promotion to assistant general manager of the New York, Chicago & St. Louis was reported in the *Railway Age* of March 3, was born on October 26, 1878, at Toledo, Ohio. He was graduated from Cornell University in 1900, and entered railway service on August 1 of that year as a special apprentice on the Lake Shore & Michigan Southern. He was promoted to special inspector in 1903, and held this position for two years, when he was promoted to night enginehouse fore-

man. He was promoted to assistant general foreman of the Collinwood locomotive shops in 1906, and a year later was promoted to superintendent of the shops at Elkhart, Ind. He was promoted to assistant superintendent of the Collinwood locomotive shops in 1908, and a year later was again promoted to assistant master mechanic at Elkhart. He was promoted to mechanical engineer in 1910, and held this position for one year when he was advanced to general mechanical engineer of the New York Central, lines west of Buffalo. In May, 1915, he was promoted to engineer of rolling stock, serving in this capacity until October, 1916, when he was appointed superintendent of motive power of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio. He held this position at the time of his recent promotion to assistant general manager, with the same headquarters.

G. C. Jones, whose appointment as assistant general manager of the Central region of the Canadian National with headquarters at Montreal was announced in the *Railway Age* of March 10, page 593, was born on September 24, 1860, at Clyde, N. Y. He entered railway service in 1874 as a messenger and yard clerk on the Atlantic & Great Western (now the Erie) at Kent, Ohio. In 1876 he went to the New York, Pennsylvania & Ohio (also now the Erie) as a yard clerk and operator. From 1880 to 1882 he served the Cleveland, Cincinnati, Chicago & St. Louis as an operator and dispatcher. He then went with the Western Union Telegraph Company as an operator and in the following year became a dispatcher on the New York, Pennsylvania & Ohio. In 1885 he entered the service of the Burlington, Cedar Rapid & Northern (now the Chicago, Rock Island & Pacific) as a dispatcher. Two years later he transferred to the Wabash in the same capacity and was later advanced to chief dispatcher. In 1896 he became assistant superintendent for the Grand Trunk and thereafter was promoted to superintendent. From 1905 to 1913 he was general manager of the Central Vermont. From the latter date until 1917 he was vice-president of the same road. From 1917 until the time of his recent appointment, Mr. Jones served as assistant to the president of the Grand Trunk.



G. C. Jones

Traffic

With the reorganization of the traffic department of the Canadian National following amalgamation with the Grand Trunk, the following appointments have been made: **G. T. Bell**, executive assistant to traffic vice-president; **H. H. Melanson**, general passenger traffic manager; **H. C. Marlin**, general freight traffic manager; **D. O. Wood**, traffic manager, foreign freight department; **A. T. Weldon**, traffic manager, Atlantic region; **Frank J. Watson**, freight traffic manager, Central region; **Lorne Macdonald**, assistant freight traffic manager, Central region; **R. W. Long**, general freight agent, Central region; **R. E. Perry**, manager, and **James Orr**, assistant manager, tariff bureau, Central region; **C. W. Johnston**, passenger traffic manager; **W. S. Cookson**, manager, passenger tariff and ticket bureau; **R. L. Fairbairn**, manager, passenger service bureau; **J. R. Melville**, assistant manager, passenger service bureau; **H. R. Charlton**, manager, and **W. L. Crighton**, assistant manager, advertising bureau; **R. F. McLeod**, assistant general passenger traffic manager; **R. Creelman**, passenger traffic manager, Western region; **W. E. Duperow**, passenger traffic manager, Central region, except lines in U. S.; **H. C. Bourlier** and **E. C. Elliott**, general passenger agents, Central region; **James Morrison**, general passenger agent, steamship traffic.

J. H. R. Parsons, vice-president and general manager of the Southern Pacific, Louisiana Lines, with headquarters at New Orleans, La., has been promoted to assistant passenger traffic manager of the Southern Pacific system, with headquarters at San Francisco, Cal., succeeding **F. E. Batturs**, whose death on December 7, 1922, was reported in the *Railway Age* of December 16. Mr. Parsons entered railway service on January 3, 1880, as a clerk in the treasurer's office of the Chicago & Grand Trunk at Port Huron, Mich. He was later transferred to the stores department at Detroit, Mich., and served in this capacity until April 1, 1886, when he entered the service of the Union Pacific at Omaha, Neb., in the stores department. He later served consecutively in the auditing and passenger departments until July 1, 1906, when he was promoted to chief clerk to the assistant director of traffic for the Union Pacific and Southern Pacific lines, with headquarters at Chicago. He was promoted on January 1, 1909, to general passenger agent of the Southern Pacific, Louisiana Lines, with headquarters at New Orleans, La. He was elected vice-president and general manager of the Southern Pacific, Louisiana Lines, on January 1, 1917, and was serving in this capacity when promoted to assistant passenger traffic manager of the Southern Pacific system, with headquarters at San Francisco, Cal.



J. H. R. Parsons

Purchasing and Stores

W. A. Hopkins, supply agent of the Missouri Pacific, with headquarters at St. Louis, has been promoted to general purchasing agent, with the same headquarters, succeeding **C. A. How**, whose death on March 5 was reported in the *Railway Age* of March 10. **L. P. Krampf** has been appointed supply agent, with headquarters at St. Louis, succeeding Mr. Hopkins.

Obituary

John Hair, formerly special engineer of the Baltimore & Ohio with headquarters at Baltimore, Md., died on March 5 at Pittsburgh, Pa.

C. A. How, general purchasing agent of the Missouri Pacific, whose death on March 5 at St. Louis, Mo., was reported in the *Railway Age* of March 10, was born in 1866 at Brooklyn, N. Y. He entered railway service in 1884, as a file clerk for the Union Pacific at Council Bluffs, Ia. A year later he entered the service of the Chicago, Burlington & Quincy at Omaha, Neb., as a clerk, being transferred a few years later to Plattsmouth, Neb., where he was promoted to chief clerk to the supply agent. He was promoted to supply agent in charge of the Hannibal and St. Joseph divisions in 1899, and was promoted to division superintendent in 1904. Later in that year he entered the service of a railway supply company, in which work he was engaged for one year, when he resigned and was appointed purchasing agent of the Wabash, with headquarters at St. Louis, Mo. He was appointed supply agent of the Missouri Pacific, with the same headquarters in 1910, and in 1911 was promoted to general purchasing agent with the same headquarters. During Federal control he served as chairman of the Regional Purchasing Committee of the Southwestern region, with headquarters at St. Louis, returning to his position as general purchasing agent of the Missouri Pacific at the expiration of Federal control. He was serving in this capacity at the time of his death.

EDITORIAL



Railway Age

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Why Operate Efficiently and Neglect Public Sentiment?

EVERY railway officer, from the highest to the lowest, has always in mind the thought that his railway and all the railways must be so managed as to develop the largest practicable business and handle it with the greatest practicable efficiency and economy.

What is the use, under present conditions, of operating a railway efficiently and economically?

This may seem a strange question. It may appear to be asked in a spirit of sarcasm or jocularity. It is, however, asked with a serious spirit and purpose.

What is the use, from the standpoint of the bond holders and stockholders of the railways, in operating efficiently and economically if every saving made in expenses is to be followed immediately by regulatory attacks which result in increases of expenses or reductions of rates that prevent the economies effected from resulting in an increase in the net return earned? The security owners get nothing except through the net return and in the form of interest and dividends.

What is the use, from the standpoint of the public, of affecting economies if these are immediately followed, or even preceded, by regulation which so restricts or reduces the net return earned as to render it impossible for the railways to raise new capital for the purpose of making improvements in and additions to their properties? Reductions of rates are of no lasting advantage to the public unless producers and shippers can secure adequate transportation for their products. The reduction of a rate is of no benefit to a producer who, in the long run, is deprived by the reduction of the rate of the opportunity to get cars in which to ship a large part of his products.

Because of the increase of business and the effecting of economies in operation the net return being earned by the railways is now increasing. But the Labor Board is advancing wages, and in every state legislature in the country numerous bills are being introduced to require the railways to employ more men and do other things that will increase their labor costs. On the other hand, there is widespread agitation, especially among the farmers, for reductions of rates, and important cases in which reductions of rates are demanded are pending before the Interstate Commerce Commission. The Commission already, in the interchangeable mileage book case recently, has ordered a reduction of passenger rates. The taxing authorities are constantly increasing taxes.

In January of this year taxes amounted to over \$25,200,000, or to \$7,700,000 more than in January, 1920, just before the railways were returned to private operation. The

effect that developments of this kind tend to have upon the net return earned is perfectly obvious. The net return earned in January seems relatively large, but in that month the railways paid out 86 cents out of every dollar they earned in operating expenses and taxes. When the margin between expenses and taxes, and total earnings is so narrow it would not take much of an increase in earnings and taxes or reduction of rates largely to reduce the net return.

Now, it may seem a paradoxical statement to make, but it is a fact that while all railway officers are trying to increase the efficiency and economy of operation, very few of them are really trying in the most practical way to maintain and increase the net return. How can this be true? The net return of the railways as a whole depends at present much less upon economy of operation than it does upon public sentiment, and while all railway officers are trying to increase economy of operation, very few are really trying to improve public sentiment. Every railway officer knows that legislatures, commissions and other regulating bodies largely control operating expenses, and entirely control rates. Therefore, many railway officers strive mightily with law-making bodies and commissions to keep them from doing things that will increase expenses and reduce revenues. This is work that ought to be done. But in the long run it is absolutely futile unless public sentiment as well as the sentiment of law makers and commissions is educated. Public sentiment in the long run determines what they do. The Esch-Cummins Transportation Act was passed by the House of Representatives by a vote of 250 to 150, and by the Senate by 47 to 17. This vote shows that an intelligent sentiment had been created among a large majority of the members of Congress. But extensive propaganda against the Transportation Act, which was not effectually met, was carried on among the public for months and years, and a large part of the men who voted for the Transportation Act were defeated for reelection, or even for renomination, largely because they did vote for it, and their places have been taken by men who are chiefly bent upon destroying the Transportation Act. If the public is not made to understand the transportation situation and the transportation problem, the effects of the failure to do so will fall upon the net return of the railways, because almost the entire attack being made upon the Transportation Act by labor leaders and radical politicians is directed against those provisions of it which were intended by its authors to secure to the railways an opportunity to earn a reasonable net return.

Of course, it goes without saying that if one railway in a group of railways is operated with relatively greater effi-